

# THE IRON AGE

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## Commercial Plant for Heat Treating Steel

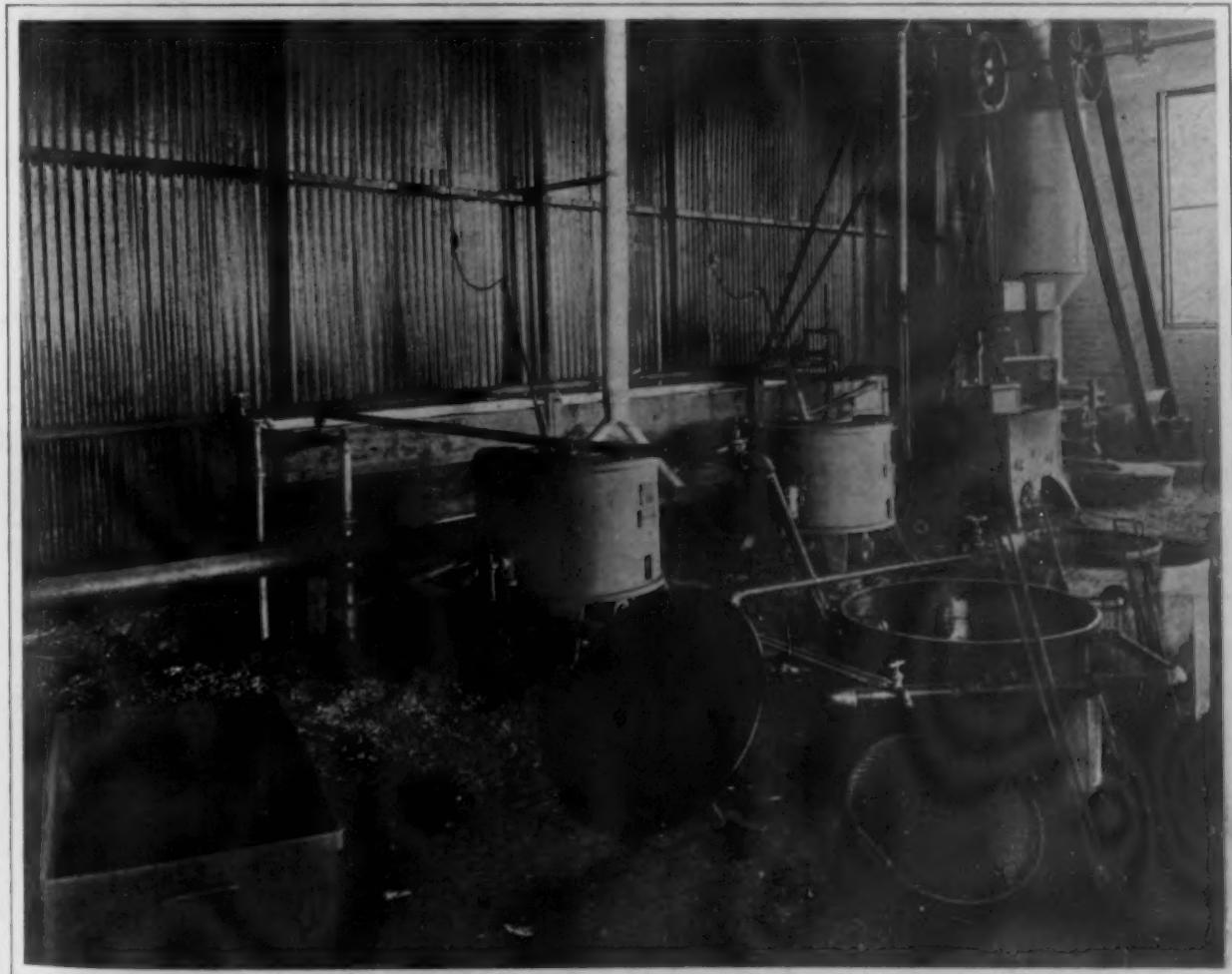
Increased Use of Heat Treated Metal Creating  
a New Industrial Field—Shop Equipment  
of the W. S. Bidle Company, Cleveland

The automobile has been responsible for the rapid increase in the use of alloy steels, and the more general demand for the heat treatment of all kinds of steel. The truly wonderful results obtained in automobile construction, where a maximum of strength and toughness with a minimum of weight is necessary, have had their beneficial influence upon many other industries. Manufacturers in other lines, noting what had been accomplished in automobiles, began applying the lesson to their own business with the result that to-day many are using heat-treated alloy steels, or are having their same old carbon steels heat treated to bring out the properties previously remaining latent.

The advent of high-speed steel with its capability to remove large quantities of material in a given time made it necessary for machine tool manufacturers to redesign

their machines to meet the possibilities of the new steel. In many cases, on account of limited space, it is not possible merely to increase the size of certain parts (to meet the added strains) and use the same material as formerly. For this manufacturers have adopted alloy steels, or for certain parts have found that a higher carbon steel than formerly used, properly heat treated, would give them the necessary combination of strength and toughness. Heat treating steels consists of course in heating and cooling in varying sequence to obtain from any piece its maximum efficiency for any given use.

The size and shape of the piece; the subsequent machining operations, if any are required; the nature of the strains and shocks to which it will be subjected in service; all exert a direct influence upon the treatment. Heat treatments must be selected with reference to what is



Commercial Heat Treating Plant of W. S. Bidle Company, Cleveland—Water and Oil Quenching Tanks in the Foreground. Lead and Oil Tempering Furnaces, Wooden Cooling Trough and Blower Equipment in the Background

commercial. With pieces entering into the construction of certain automobiles selling at a high price, a number of operations to drain the last drop of blood, so to speak, from a certain steel may be warranted; in other classes of machinery such an expense may be prohibitive and fewer operations must suffice. Small samples tested in the laboratory show the critical changes to take place at certain temperatures and theoretically these are the correct points to be considered, but as large pieces do not respond in the same way as small ones, in practice these temperatures are modified by judgment and experience to meet the conditions.

A piece of steel of the best quality improperly heat treated may not serve the purpose to which it may be put as well as one of an inferior quality properly heat treated. To obtain results a knowledge of the proper treatment is of course paramount, the necessary equipment must be at hand to carry out with the least error the treatment selected, and as not uncommonly emphasized, eternal vigilance in the shop must be exercised.

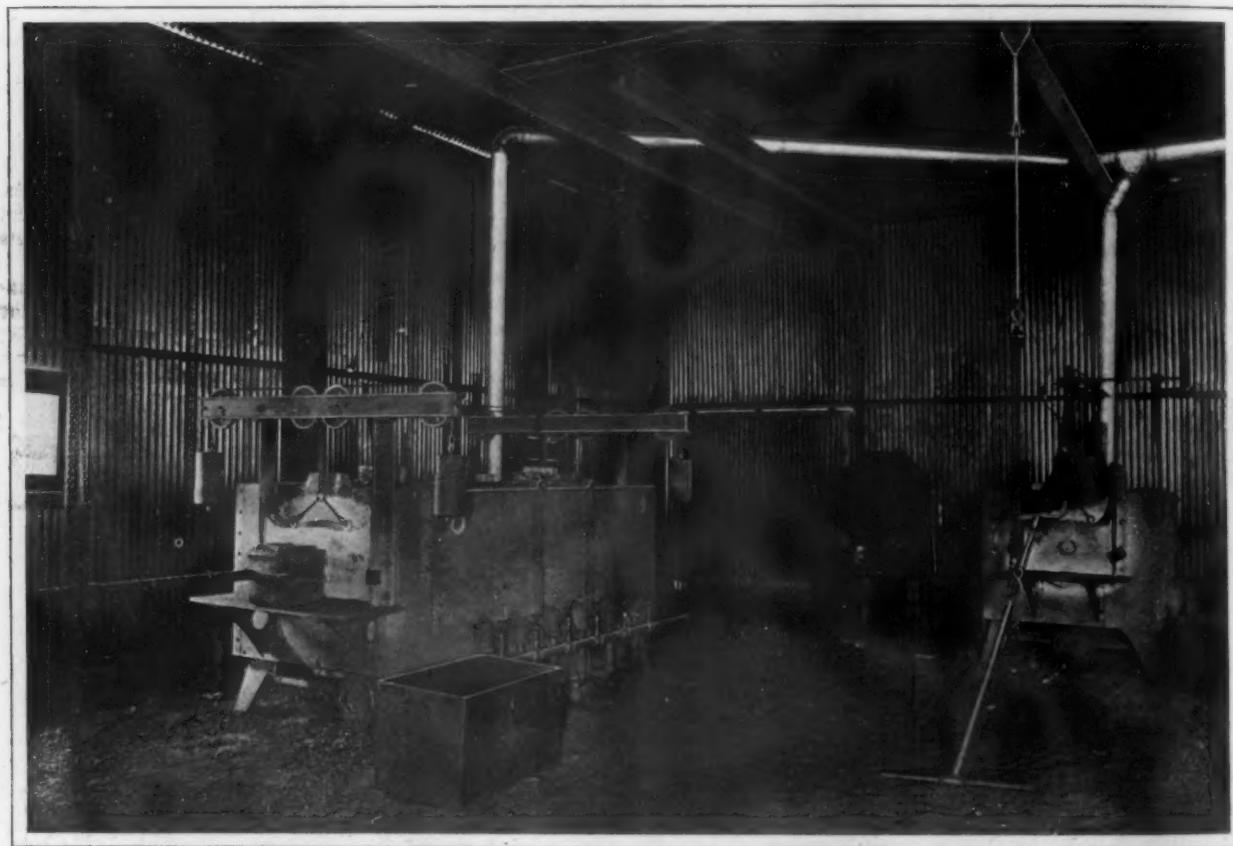
The case carbonizing of steel has been given a great

case somewhat and primarily to relieve any strains set up in quenching.

Case carbonizing compounds that are reliable and efficient and which will give uniformity to the case, are to be had from several concerns. Case carbonizing has its own field for which it is pre-eminently suited, but has proved a delusion as a substitute for crucible steel in cutting tools.

Many manufacturers of tool steel willingly spend the money for good material, their workman put many hours and days of machine work upon it before it is ready for the hardener, and then the final operations of hardening and tempering are handled in a slipshod manner.

Pyrometers for use in these connections must be regularly checked by the known melting temperature of certain metals or salts, or by comparison with a carefully kept standard. Cold ends must be kept at nearly constant temperatures, or corrections made from the readings of the pyrometer to allow for such variations. This means that some one of ability or experience must be obtained to look after the pyrometers.



Large Heat Treating Furnaces and Oil Quenching Tanks of the W. S. Bidle Company, Cleveland

amount of study and is fast being reduced to a science. The process as employed not so many years ago consisted of packing the parts in boxes, the compound used not being given much thought, heating for a certain length of time to give the required depth of case, the temperature of the furnace being judged entirely by the eye of the operator, and then dumping the contents of the boxes into water. In the light of modern knowledge this procedure is recognized as being very crude and not productive of good results. The core of the pieces hardened in this manner would be coarsely crystalline, possessing but little strength and no toughness, the case on account of being quenched at too high a temperature would be in the same condition as a piece of tool steel that had been badly overheated.

Since the heat treatment of steel has become thoroughly understood, it is recognized that to procure satisfactory results it is necessary to heat treat the carbonized pieces, first to put the low carbon core in a fine and tough condition since in the casing operation it has become coarsely crystalline, second to refine the high carbon case, third—although not necessary in all pieces—to reheat, preferably in an oil bath, to draw the temper of the

There are many concerns in this country which maintain expensive laboratories and are constantly experimenting to improve their product. There are others, however, whose scale of operation does not warrant the expense necessary to install a complete equipment and maintain an expert force to handle it. To supply this field the W. S. Bidle Company has recently completed a shop located at 1411 East Forty-fifth street, Cleveland, devoted to commercial heat treating, case carbonizing and the hardening, tempering and annealing of tool steels.

The Bidle plant occupies a structural steel frame building with steel roof trusses 55 x 60 ft. The west and south side walls are of brick and the other two sides are covered with corrugated iron, this construction being provided with the view of extending the building 40 ft. to the east and later doubling the enlarged plant by another section on the north side, making the plant 100 x 110 ft. Steel supporting columns were placed along the north wall. When the plant is enlarged to its contemplated size these columns will be in the middle of the building. Windows were provided to admit only a moderate amount of light to the heat-treating part of the plant and the furnaces are located on the side having the least light. It

was believed that more satisfactory results could be obtained by the absence of an abundance of light, as this permits the furnace attendant to rely to some extent on his eye to judge by comparing the color of the metal being heat treated with the end of the tube in determining whether or not the metal under treatment has been brought up to the temperature the pyrometer indicates. Artificial lighting is provided by incandescent lights, the largest of which are of 150 watts.

The furnace equipment consists of one single opening and one double opening underfired gas furnaces of the semi-muffle type, two small furnaces designed particularly for heating carbon and high-speed tool steel, two lead furnaces and an oil-tempering furnace. The two large furnaces are used for case hardening and heat treating. One has a heating chamber 36 in. wide, 84 in. deep and 18 in. in height. The other is 27 in. wide, 48 in. deep and 19 in. in height. The doors are counterweighted as usual with chain and sheave wheels to insure ease in operation. An I-beam trolley and chain hoist is used for charging the large furnace with the heavier pieces and the case hardening boxes.

The larger of the two small furnaces is used both for heat treating and for heating tool steel. This has a double chamber, the upper being 24 in. wide, 24 in. deep and 8 in. high, used for pre-heating. The lower chamber is 24 x 24 x 12 in. The other small furnace has a chamber 14 in. wide, 18 in. deep and 11 in. high, and is used for heating carbon steel. This furnace has a small chamber on one side designed for high-speed steel. High-speed steel is heated slowly up to a temperature of about 1700 deg. in the larger chamber and then is heated rapidly in the small chamber up to about 2200 deg. The oil-tempering furnace has a basket 15 x 21 x 12 in. in dimension. The two lead furnaces have iron crucibles 12 in. in diameter and 12 in. deep. One of these will be equipped with a cover so that it can be used for cyaniding small articles. All of the furnaces are the Frankfort type, built by the Strong, Carlisle & Hammond Company, Cleveland. Air blast is supplied by a Roots' positive pressure blower with a capacity of 1500 cu. ft. of free air per min. driven by a 25-hp. gas engine.

The equipment includes pyrometers furnished by the Beightlee Electric Company, Cleveland. A switchboard in the shop allows connection being made with any of the furnaces. In the office there is a combined indicating and recording instrument, with which the temperature of any furnace can be taken or a record can be made of the temperature of any two furnaces.

Especially designed equipment has been installed for quenching purposes. Located so that it is easily accessible to the two large furnaces is an oil-quenching tank used for vertical quenching in connection with those furnaces. This is a round steel tank 36 in. in diameter and 10 ft. deep, being set down in the ground so that the top is about 2 ft. above the floor level. The oil is circulated with a centrifugal pump operated at a speed that will supply 120 gal. of oil per min. to the quenching tank. The oil is discharged at the bottom of the tank and flows by gravity to an overflow tank from which it is pumped for cooling through 240 ft. of 1 1/4-in. pipe in coils placed in a long wooden water tank to which fresh water is supplied from the city mains. The overflow from the quenching tank is drawn off at the top of the tank at four points 90 deg. apart, so that an even overflow is provided from all sides of the tank. Suspended by four chains in the oil quenching tank is a circular plate 1/2 in. in thickness. This makes a false bottom which can be raised or lowered to provide the desired depth for the pieces that are being quenched. This plate is filled with small holes to allow the free circulation of oil from the bottom to the top of the tank.

In connection with the furnace with the pre-heating oven and the two lead furnaces there is an oil-quenching tank and a water-quenching tank, each 30 in. in diameter and 36 in. deep. The arrangement of these smaller tanks is similar to that of the larger one described above. The supply for the smaller oil tank is circulated with a centrifugal pump driven at a speed to furnish 30 gal. per min. This oil is passed for cooling through 96 ft. of 1-in. coiled pipe in the same water tank, in which the oil used in the larger tank is cooled.

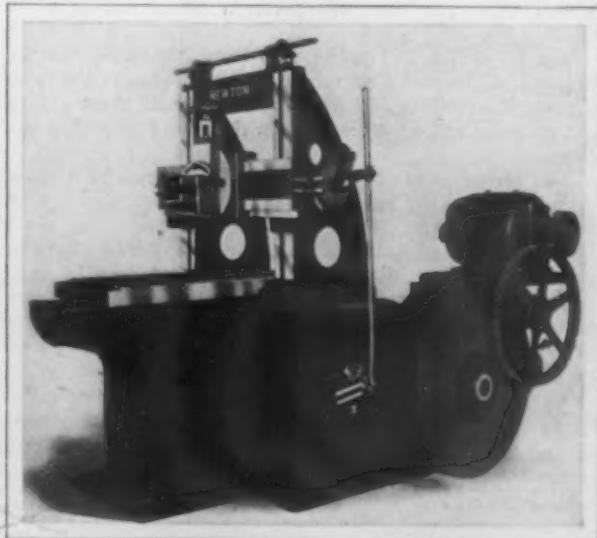
The plant equipment includes a 100,000-lb. testing ma-

chine furnished by the Riehle Brothers Testing Machine Company, Philadelphia, and the necessary equipment for polishing samples for etching and for examining under the microscope.

At the head of the company as president is W. S. Bidle, who is also treasurer. R. J. Frackelton is vice-president and F. C. Tegtmeier is secretary.

### A New Crank-Driven Planing Machine

One of the recent products of the Newton Machine Tool Works, Inc., Philadelphia, Pa., is a high-duty planing machine with crank drive. A notable feature of the machine is the incorporation of a gear speed box, which provides a 5 to 1 range in cutting speeds, by using a single pulley drive. If, however, it is desired to operate the machine by an electric motor, this can be easily done, as the pad for the reception of the motor is an integral part of the machine. Another interesting feature about the machine is that all the stresses are opposed. For example, when a cut is being taken the tendency is for the work to



A Recently Developed Planing Machine Equipped with a Crank Drive and a 5 to 1 Geared Speed Box

push the tool and indirectly the cross rail closer to the upright.

The work table is of heavy box construction with square locked bearings on the base, which is the builder's standard type of construction. Side adjustment and wear are compensated for by adjustable screws. The table is driven by a crank, as the name indicates, the motion being controlled through a Whitworth motion, which gives a quick return to the stroke.

The cross rail has a hand vertical adjustment, and the tool apron is fitted to a clapper box which can be adjusted to provide the necessary clearance for the tools on the return stroke. The clapper box is mounted on a slide, thus providing horizontal, vertical and angular feeds and a hand adjustment when desired.

The following table gives the principal dimensions and specifications of the machine:

Maximum width of work handled, in.	24
Maximum height of work handled, in.	24
Width of work table, in.	20
Length of work table, in.	40
Maximum length of stroke, in.	24
Net weight of machines, lb.	8,500

When the machines are to be used for finishing locomotive shoes and wedges, they are provided with a turret tool post and angular fixtures to give an increased output.

The Pont-à-Mousson Blast Furnaces and Foundries, Meurthe-et-Moselle district, France, are erecting 80 coke ovens of the Still regenerative type. In connection with these ovens there is also being erected a direct ammonium sulphate plant of the Still direct type for which a United States patent has recently been granted, and a benzol recovery and rectification plant. Bagley, Mills & Co., 50 Church street, New York, are the representatives for the Carl Still system processes in this country.

## A 26-In. Cross Slide Flat Turret Lathe

A Manufacturing Machine Tool with an Interesting Arrangement of Feed Stops

A cross slide flat turret lathe for handling work up to a maximum length of 26 in. and not more than  $2\frac{1}{4}$  in. in diameter, has been brought out by the Modern Machine Tool Company, 4657 Spring Grove avenue, Cincinnati, Ohio. This tool has a somewhat novel arrangement of stops for the transverse and longitudinal feeds to the cross slide, and a patent type of belt shifter is used.

The headstock and bed are cast in one piece, and a three point bearing is used, this type of construction being relied upon to prevent springing of the bed when the lathe is set on an uneven floor. Friction back gears are provided for the headstock, the gears being located in the bed under the spindle. The carriage is gibbed to the outer edge of the bed and has a bearing on the V's throughout its entire length. The turret is a circular plate 18 in. in diameter, the lock bolt being located close to the edge of the turret. The index is of large diameter, which is calculated to insure ease of operation when indexing the turret.

The cross slide has 195 sq. in. of bearing surface on the carriage and the long, narrow dovetail guide is relied upon to prevent cramping. There is a full length taper gib to take up wear and a parallel gib on the rear for holding the slide down.

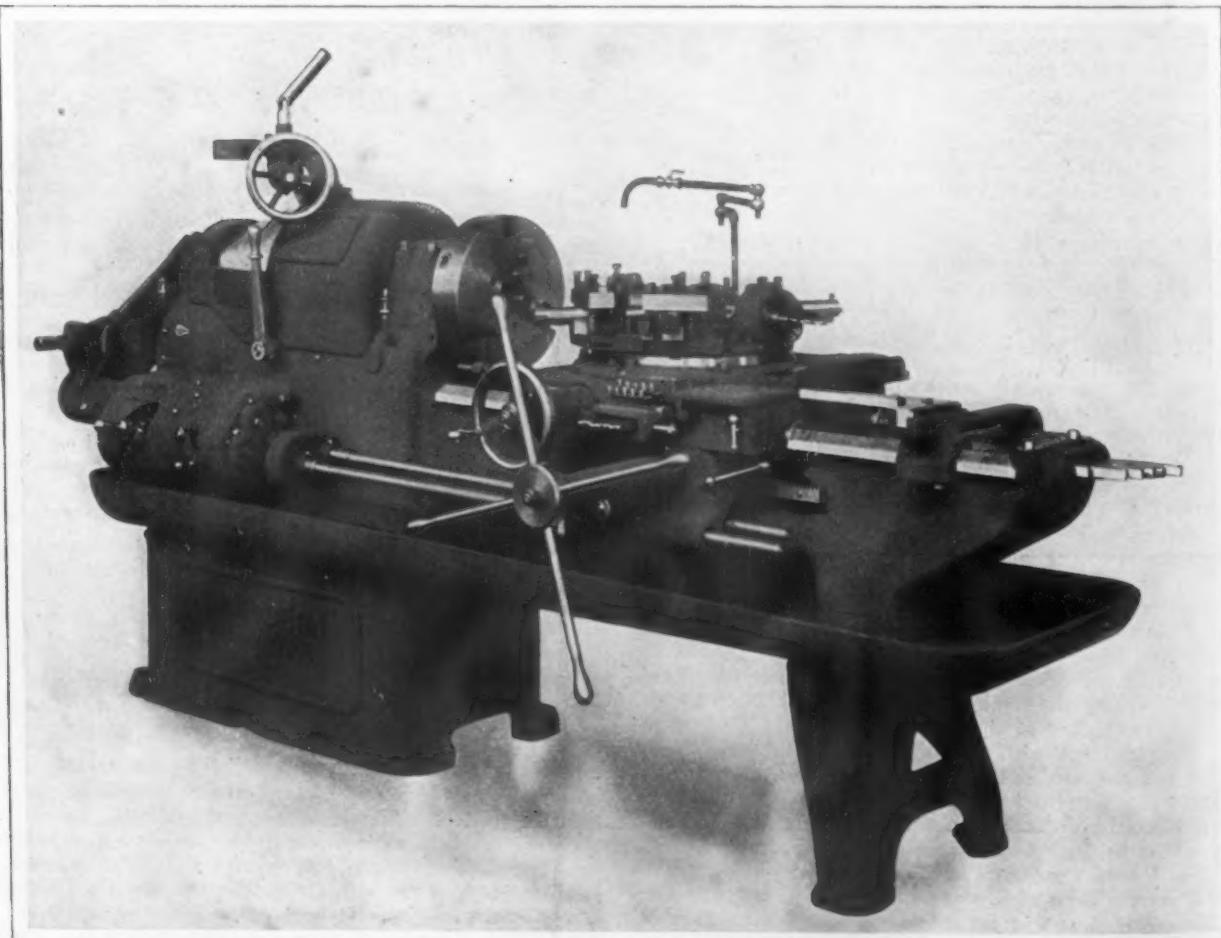
The center position is automatically located by a taper locking bolt on the head end of the carriage, which may be disengaged when the cross feed is used. The cross slide has 7 in. of travel and has 10 stops that stop the slide in either direction. The stops, which may be used for one tool or in combination for any series of tools, are engaged by a set of plungers located at the front of the carriage, all of which are operated from any location of the slide.

The longitudinal stops are located centrally between the V's of the bed and number 12 in all, two for each position

of the tool. By rotating the turret, the longitudinal stops are automatically registered for the proper tool position in use at the time, that is, two stops become available, either one of which may be used by turning the small ball crank shown at the left side of the carriage a quarter of a revolution. The turret is indexed and the stops are active, regardless of the position of the cross slide. In this way, it is pointed out, the necessity of returning the tools and cross slide to the central position to index the turret is done away with.

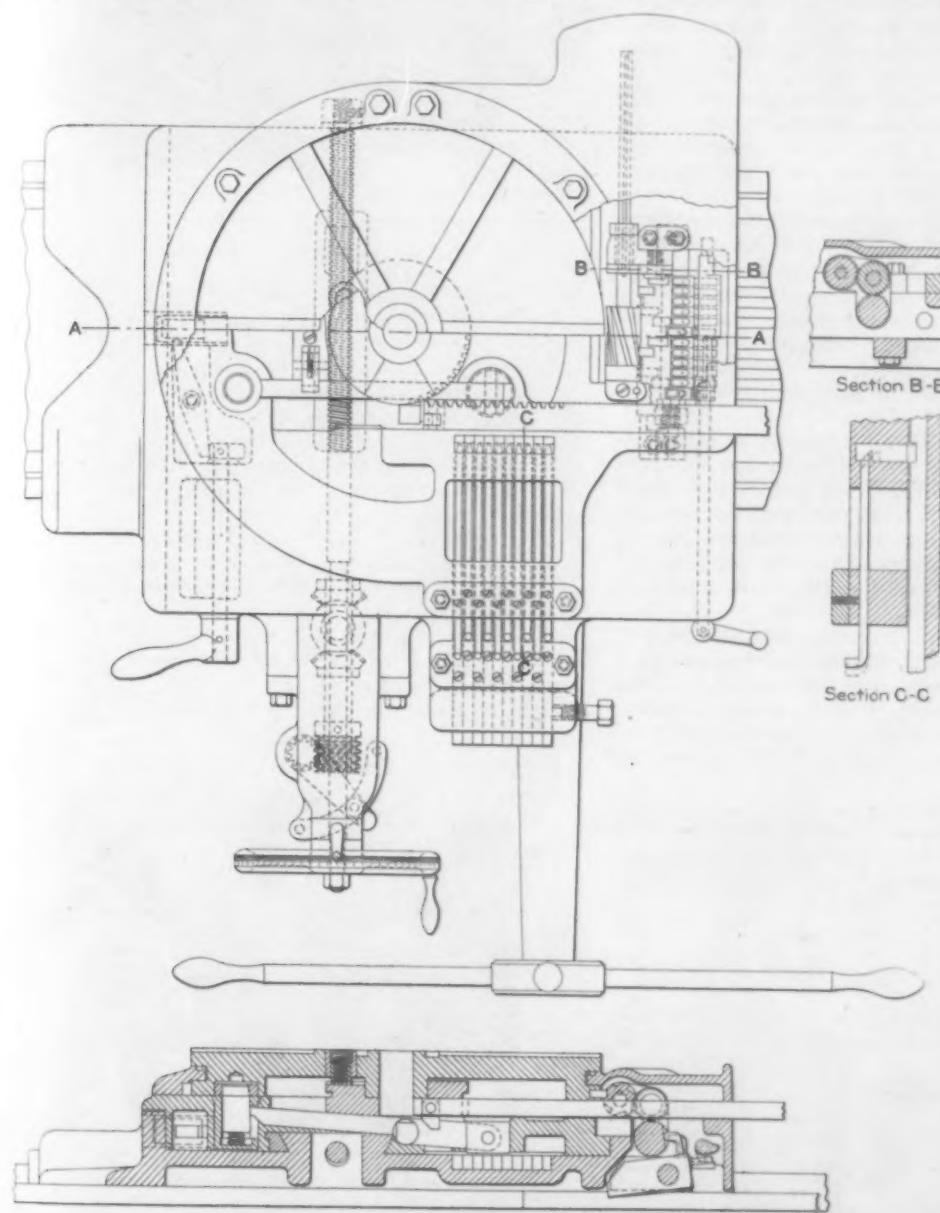
There are 10 transverse or cross stops, which are conveniently located on the carriage. These can be used at the will of the operator, and the entire set has one tool position, or can be used in any combination of the ten for any or all of the six turret tool positions. They are not indexed or registered by the rotation of the turret, but are independent of the turret rotation, and may be engaged or disengaged, regardless of the position of the cross slide. The detail designated as the section on C C in the accompanying line drawing shows the mechanism employed in manipulating the stops, and also the means of locating the cross slide and the turret in the central position. This is accomplished by a hardened tool steel plunger, having a tapered end which seats itself in a tapered bush located in the saddle or carriage. The plunger is carried in the cross slide and is spring actuated, thus removing any possibility of failure to locate the turret centrally.

When the cross slide is being used the handle at the left is turned down, which in turn moves the small eccentric shown dotted against the lever that engages with the plunger. This action withdraws the plunger from the locating bush and after the facing or turning required is completed, the handle is raised, which causes the plunger to become active, and when the slide has reached approximately the central point the plunger will seat itself in the locating bush. It will be noticed that the cross feed power control is governed by a single lever, the stopping, starting and reversing being independent of the longitudinal feed. When the cross feed lever is in the neutral position there



A Recently Developed  $2\frac{1}{4} \times 26$  In. Cross Slide Flat Turret Lathe

are no heavy gears to turn when hand feed is employed, which it is pointed out subjects the cross feed screw to strain, due to the moving of a heavy gear train. All of the gears and parts are carbonized and hardened to insure accuracy. The micrometer adjustment for the cross slide



Details of the Longitudinal and Transverse Stop Mechanism Employed

is located on the periphery of the cross feed screw hand wheel and the pointer is adjustable at the will of the operator.

The following table gives the principal dimensions and specifications of the lathe:

Swing over V's, in.....	20
Swing over carriage, in.....	16
Swing over turret, in.....	6
Travel of carriage, in.....	26
Travel of cross slide, in.....	7
Diameter of hole in spindle, in.....	2 3/4
Minimum speed, r. p. m.....	18
Maximum speed, r. p. m.....	350
Minimum feed per revolution of the spindle, in.....	0.005
Maximum feed per revolution of the spindle, in.....	0.085
Maximum speed of countershaft, r. p. m.....	225
Minimum speed of countershaft, r. p. m.....	112
Floor space required, ft.....	4x11
Net weight, lb.....	6,150
Crated shipping weight, lb.....	6,750
Boxed shipping weight, lb.....	6,950

The belt shifter furnished with the lathe is operated by a handwheel that is so timed that one turn of the handwheel shifts the belt from one step to the next.

The Carbo Steel Post Company, with factory at Chicago Heights, Ill., announces that, beginning December 1, its main sales office will be located in the Rand-McNally Building, Chicago.

## American Iron, Steel and Heavy Hardware Association

The semi-annual meeting of the executive committee of the American Iron, Steel and Heavy Hardware Association was held in the La Salle Hotel in Chicago, November 11 and 12. Several matters of interest to the trade were discussed, and the situation in the heavy hardware business was very thoroughly gone over. On the whole the feeling with regard to the business conditions was good.

One of the chief duties before the committee was the appointment of a permanent secretary to succeed E. R. Yarnelle, who resigned last June. The committee selected for this position John G. Purdie, who had been associated with Mr. Yarnelle during his connection with the association. His office is in the Marbridge Building, Broadway and Thirty-fourth street, New York. The date for the next annual convention, to be held in Cleveland, Ohio, was fixed for May 26 to 28, 1914. The Hotel Hollenden was selected as headquarters. This session of two days, which takes the place of a semi-annual convention of the membership, with members of the executive committee representing what is practically a district, is stated to have been one of the most profitable and interesting gatherings the association had and will, without doubt, result in real lasting

good, not only to the members of the association but to the heavy hardware business generally.

## New French Steel Plants

Recent iron and steel developments in France as given by the London Times are as follows:

The Société des Longwy is installing the first of four 24-ton converters and the two new 25-ton open-hearth furnaces lately put in service are regularly employed. The new 350-ton mixer is completed, and one of four 60-ton oscillating furnaces is being rapidly pushed to completion. A second blooming and rolling mill for thick plates is being erected. A 6000-hp electric power plant, supplied with gas from the blast furnaces, will be finished by the end of the year.

The new blast furnace of the Usines Métallurgiques de la Basse Loire at Trignac is working regularly, and operations were recently started with the new steel works designed for a yearly output of 80,000 tons. Six 2100-hp gas engines have recently been installed and work is progressing on a new rolling plant, of which the electrically driven blooming mill is already in operation.

The new steel works of the Acierie Arbel at Berce Gayant, Douai, has started its 30-ton open-hearth furnace, and a second one is soon to be put in service.

### U. S. Metal Products Company's Affairs

A joint meeting of the directors of the U. S. Metal Products Company, College Point, Long Island, N. Y., and the Art Metal Construction Company, Jamestown, N. Y., was held November 17 and adjourned for a further session that evening. Following this meeting a statement, issued by the U. S. Metal Products Company, said that a number of the large note creditors had agreed to a six months' extension of their loans. Also that with one exception there would be no difficulty in renewing the present note indebtedness of the company until it was permanently financed. Presumably the one exception was the Chase National Bank, the holder of a note for \$75,000.

It was also announced that a syndicate had been organized to purchase from the U. S. Metal Products Company for cash certain of its slow assets that are not used in connection with the business, the offer being contingent upon a satisfactory adjustment of its notes and merchandise accounts. Officials of the company, together with A. B. Turner, of Turner, Tucker & Co., were appointed a committee to adjust the company's affairs. The plant continues in operation.

A further development of this adjourned session, it is stated, resulted in the Art Metal Construction Company relinquishing whatever interest it had in the U. S. Metal Products Company. It may be recalled that last summer the Art Metal Construction Company made an offer to exchange one share of its common stock for one and one-half shares of the U. S. Metal Products Company's common stock.

It is understood further that the National Steel & Bronze Company, of Boston, formed last summer as a holding company, to take over the common stock of the U. S. Metal Products Company, now has in its possession a little less than \$4,000,000 worth of common stock of the U. S. Metal Products Company out of a total outstanding issue of \$5,000,000.

Clayton E. Bailey, who has been at the head of the U. S. Metal Products Company since September 1, has resigned as president and also as director, and hereafter will devote his entire attention to the business of the Art Metal Construction Company, of which he is president.

### New Engine Lathe with 11-In. Swing

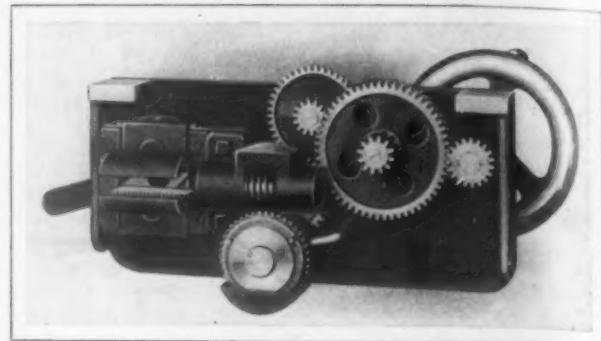
A recent addition to the large number of machine tools built in Worcester, Mass., is an 11-in. engine lathe, designed for general machine shop and manufacturing purposes, which has been placed on the market by the Worcester Lathe Company, of which Charles E. Thwing is the proprietor. While following the general practice in the design



View Showing the Arrangement of the Gear Box and the Method of Changing to a New Series of Feeds and Threads

of machines of its class, it possesses several interesting features which tend to convenient operation and a comprehensive range of usefulness.

The drive is from a four-step cone pulley, with single back gears, the range of speeds being in approximately geometrical progression. The hammered crucible spindle runs in cast-iron ring oiling bearings and has a collet with a No. 4 Morse taper. The tailstock is of the cut-away type, with a long bearing on the bed, and has an adjust-



View of the Apron Showing the Arrangement of the Gearing

ment for turning tapers. The bolt and a shoe fasten it to the bed, the bearing being upon one V and one flat surface. The tailstock spindle is operated by a handwheel and is clamped to the barrel by a plug.

The carriage has a long bearing on the high front V and a large surface on the rear of the bed, and is gibbed both back and front, with a binder at the back that is used when the cross feed is engaged. The tool post is of the ring and wedge type, and the compound tool block is graduated in degrees, being easily set by loosening a bolt and retightening. It can be quickly removed when it is desired to use a plain tool block in its place. The dial on the cross feed screw is graduated in thousandths of an inch.

The apron as can be seen from one of the accompanying engravings is of the worm-driven type with a steel worm and a friction of the flat disk pattern. Three changes of screw pitch and feed are obtained in the gear



The Hinged Cover of the Thread Cutting Gear

box, a sliding gear being employed. To secure any other changes the bushing which binds the gear sweep is loosened by a bolt, the hinged cover of the thread cutting gear is lifted and the link that keeps the gear in place in the upper gear box shaft is pulled. The gear is removed and replaced with another that enables the desired pitch to be secured.

The countershaft is of the flat disk friction type with boxes having ring oilers. The pulleys are furnished with self-oiling wicks.

### Saloons and the "Safety First" Campaign

Thomas D. West, Cleveland, chairman of the committee on safety appointed at the convention of the American Foundrymen's Association at Chicago last month, announces that one of its objects will be to reduce the number of saloons located in close proximity to manufacturing establishments. Mr. West recently addressed a letter on behalf of his committee to the commissioners having in hand the granting of licenses to saloons in Cleveland. It called attention to the increased liability to accident because of workmen visiting saloons at the noon hour or in working hours, and asked that the commissioners withhold licenses from saloons located close to shops, especially plants in which the work is of a hazardous character.

Mr. West added that this question had come up for discussion at the American Foundrymen's Association convention at Chicago on October 16, and that emphasis was

laid on the harm resulting from the maintenance of saloons at the doors of factories, particularly those whose work involves considerable hazard and those in which men are employed at night. Mr. West's committee when completed will have one member from each State. The question of removing saloons to as great a distance as possible from industrial plants will be given prominence in its campaign for "Safety First." Mr. West has also brought this phase of his committee's work to the attention of officers of the National Founders' Association and has asked the co-operation of that organization.

### A New Metallographic Laboratory

A complete metallographic outfit has been installed in the office of the naval inspector of engineering material at Chester, Pa. It consists of one of the most modern microscopes fitted with a camera for taking photomicrographs and with an electric illuminator. All the necessary paraphernalia for preparing specimens of steel for observation are also provided. While this office is under the immediate jurisdiction of the naval inspector located at the Midvale Steel Works, Philadelphia, it is devoted chiefly to looking after the inspection of castings and other material furnished the Government in or near the Chester district. The arrangements are such that photomicrographs can be furnished to any department of the Navy in that district. The work is done by K. D. Williams, the civilian inspector of that office. The object of this new departure of the Government is to have at hand a ready means of settling certain questions as to heat treatment and other matters that arise, without a more or less tedious reference of the matter to Washington.

It is understood that arrangements have been made to incorporate in the new specifications for forgings for the navy the requirement of a photomicrograph of a specimen of steel from each end of a crank shaft, to determine whether the heat treatment has been proper, no matter if the physical requirements of the steel have been met. In fact, this procedure, it is said, is already being carried out in the examination of certain forgings.

### Titanium Rails Compared with Non-Titanium

The third bulletin on steel rails has been issued by the Titanium Alloy Mfg. Company. The two previous bulletins, which have been noticed in these columns, were preparatory to No. 3, which gives a complete summary of the chemical and physical results of seven sets of standard and titanium-treated open-hearth rails which were chosen and furnished either by the railroad or the manufacturer. Some of the conclusions derived from the tests are thus stated in the bulletin: 1. The tensile tests show on an average much better ductility for the treated rails, especially in the heads, than for the untreated. 2. Impact tests show an average in shock resistance of 50 per cent. for the treated over the untreated, in the head, web and flange. 3. Endurance tests on the White-Souther machine show that the treated rails are much less easily fractured by fatigue or by constantly repeated stresses below the elastic limit. 4.

Chemical analyses, hardness tests and Landgraf-Turner endurance tests (above the elastic limit) all show greater uniformity in the treated than in the untreated steel, indicating less segregation with its attendant evils. The bulletin is illustrated with excellent sulphur prints and photomicrographs. The tabular résumé of the tests is extensive, full details being given of chemical analyses and the various physical tests.

The Lukens Iron & Steel Company, Coatesville, Pa., is installing a new water supply system, which will make 9,000,000 gal. available daily. It will also give an even pressure in all parts of the mill, which was not possible under the old gravity system. The water is obtained from Brandywine Creek, which runs through the property, and the pressure is obtained by three centrifugal pumps, operating through an elevated 50,000 gal. tank.

### A New 6-Ft. Radial Drilling Machine

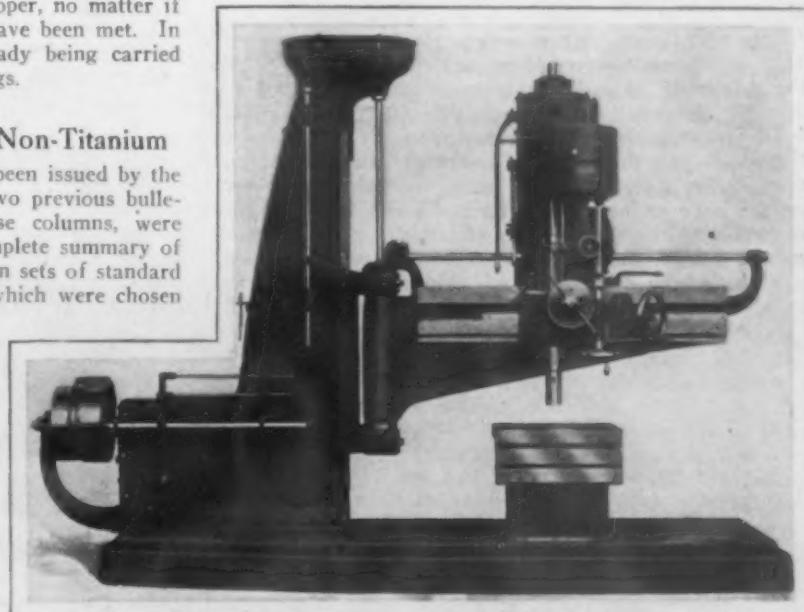
The Reed-Prentice Company, Worcester, Mass., has brought out an improved type known as the 6-ft. heavy-pattern radial drilling machine. It is of massive construction and all the gears are incased in guards cast integral with the frame, safety having been given special consideration. The counterbalance weight is constructed so that it could not drop if the chain should break, and safety stops are employed to prevent the saddle from feeding too far in either direction, thus insuring the gearing against breakage.

The speed box is located at the rear of the post to which it is bolted rigidly, so as to form an integral part. Four speeds are provided, any one of which can be obtained while the machine is operating, it is explained, even with the drill taking a cut, without shock to the mechanism. The clutches are arranged so that it is impossible to engage any two conflicting gear ratios, both levers having to be in the operative position in order that the machine may be started.

The upper portion of the post is cast to cover both the driving and the saddle elevating gears, the latter being engaged by the vertical rod shown at the side of the post. The down feed is twice that of the up feed and the arm is mounted in a large bearing, having ball thrust collars at the lower end to facilitate swinging.

In constructing the machine, all the driving, feed and tapping gears, the spindle counterbalance, the levers and other parts are all completely assembled as a unit in the sliding head before it is placed on the arm. Before this is done, however, the horizontal arm shaft is located in the desired position by jigs and fixtures and is drilled and bolted in position. In this way it is pointed out that perfect alignment of the shaft and the correct meshing of the driving bevel gears near the column are secured.

A two-speed mechanism in the head provides slow



A 6-Ft. Heavy Pattern Radial Drilling Machine Equipped with Helical Cut Spur Gears and Ball Bearings

powerful speeds for heavy work and high ones for lighter pieces. This mechanism, in conjunction with the four changes in the speed box, provides eight speeds in all. The tapping attachment is located so as to be available at all times, the lever being placed at the right of the head.

One of the features of the design is the use of the helical cut spur gears, employed partly to reduce noise to a minimum. The machines are built either with ball bearings throughout or with bronze bushings, the former arrangement being the one recommended, as the power consumption is cut almost in half.

A colorimetric method for the determination of titanium in iron and steel is published by C. R. McCabe, Lima Locomotive Corporation, Lima, Ohio, in the September issue of the Journal of Industrial and Engineering Chemistry.

# Automatic Furnace Hoists at Monessen, Pa.

## Installation at Works of Pittsburgh Steel Company Whereby the Large Bell Is Dumped with Desired Numbers of Skip Loads

The two blast furnaces of the Pittsburgh Steel Company blown in this summer at Monessen, Pa., are charged by bell hoists which are automatically controlled electrically by the action of the main skip hoists. Not only is the opening and closing of the bells in the top of the blast furnace thus removed from the carelessness or indifference of the operator, but the large bell may be made to operate regularly for desired numbers of skip loads. For example, it may be desirable to deliver to the furnace for every two, three or four skip loads, and once the devices are set, the machinery will continue to repeat its cycles, operating the large bell after the small bell has dumped on the large bell the contents of the requisite number of skip loads. The details of the furnace hoists, which include a special skip hoist for removing dust from the coke screens, were worked out by the Otis Elevator Company, which installed the apparatus, but the new plant of the Pittsburgh Steel Company in its entirety was built under the direction of the Garrett-Cromwell Engineering Company, Cleveland.

The operation of the automatic charging of each blast furnace is briefly as follows: When a skip load of material is started up at the bottom of the incline, the circuit for the small or upper bell hoist is automatically made, and the small bell opens and closes once, dumping the preceding load on the large or lower bell. Each operation of the small bell is electrically recorded, as it may be termed, and after a predetermined number of skip loads have been delivered by the skip into the furnace top and passed by the small bell, the large bell is automatically

opened and closed, allowing the accumulated round of material to fall into the furnace.

When the plant was first designed, it was believed that rounds of three and six loads would be satisfactory; but actual operating conditions have shown that rounds of two, three, four or six loads may be desirable and the automatic feature may now be set by the furnace manager for any of these sequences of operation. Means are pro-

vided whereby the manager may at any time insert an extra load into any round, and he may work the bells independently of the automatic device, by unlocking the small iron boxes shown in Fig. 4, and pressing the proper button. The circuits of the bell hoists interlock, to prevent both bells from being in operation simultaneously.

To give an idea how the large bell is operated under the control of the small bell, the drawings of a so-called ratchet magnet is given in Fig. 1 and a diagram to elucidate the device for changing the number of skip loads per cycle in Fig. 2. The ratchet magnet as it appears in real life is indicated in the upper left of Fig. 3, which is a view of the controller board for the two bells of one blast furnace.

The operation of the small bell energizes the magnet coil of the ratchet mechanism, indicated by the coil in Fig. 2 and the solenoid, lifting the ratchet, turns a special form of commutator, so to speak,

through an angle of 30 deg. In Fig. 2 this commutator is shown concentric with two dotted circles. These are marked off into 12 equal divisions, or 30 deg. each, and indicate the successive positions which the commutator

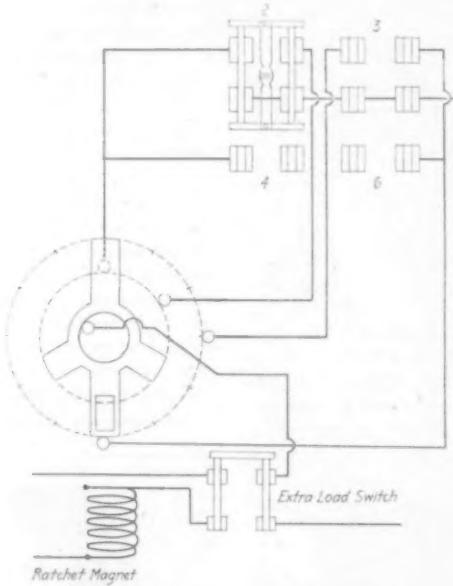


Fig. 2—Diagram of the Sequence Control Between the Large and Small Bells

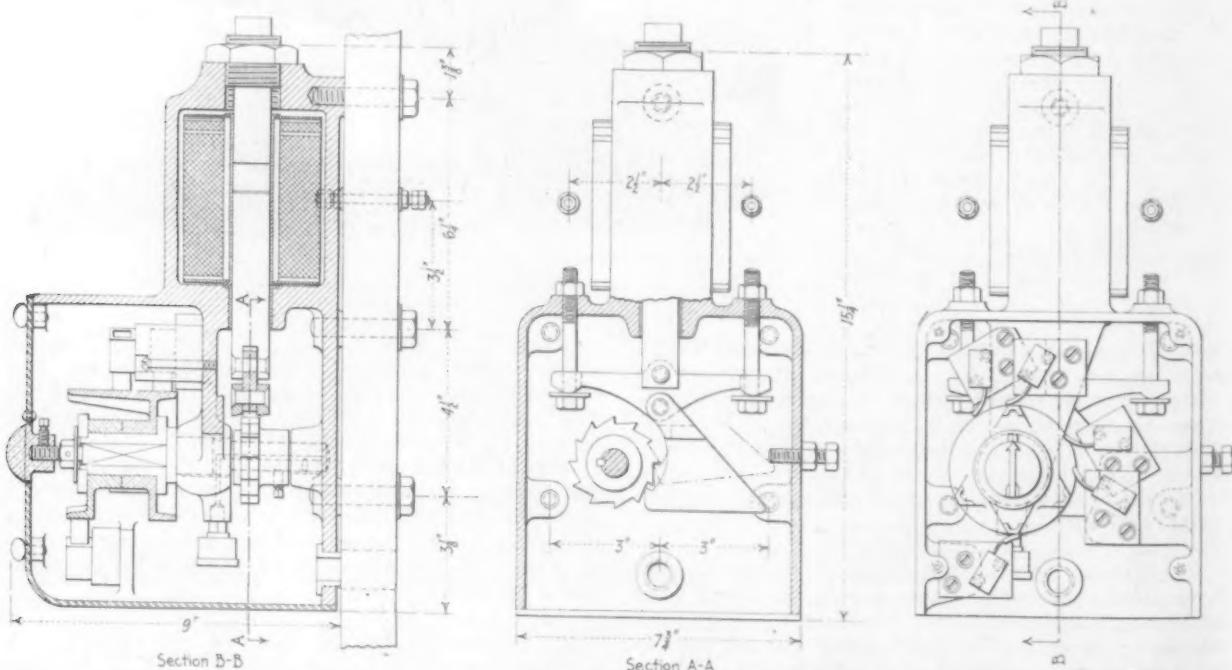


Fig. 1—The Ratchet Magnet which is Actuated Every Time the Small Blast Furnace Bell Operates and which Closes the Circuit Controlling the Large Bell According to the Number of Skip Loads to be Delivered Into the Furnace at One Time

takes with every operation of the small bell. The small circles in the diagram represent brushes. The one in the innermost position forms one end of the circuit which controls the operation of the large bell and is always in contact with the commutator. The others have been placed so that with a proper arrangement of switches the automatic operation in different cycles may be obtained.

The long arms of the commutator can be swept by the brushes located against the larger circle, while the shorter arms come in contact with the brushes touching the smaller circle. The small rectangle toward one end of one of the longer arms is to indicate that this arm end bridges over the contacts on the smaller circle and never comes in contact with the brushes located on this circle, though this is not true of the other long arm. From the brushes may be traced the wiring leading to clips such as are employed for knife switches. Instead of being of a usual form, however, a pair of knives are mounted as indicated in the diagram with a handle parallel to and between them. One group of four clips so connected provides for the sequence of 2, that is, for one operation of the large bell after two dumpings of the small bell and therefore of two skip loads; another group is for the 3 sequence; another for the 4 sequence and the fourth for the 6 sequence. The special form of the knife mounting provides that only one sequence can be attempted at the one time, a condition which it might not be so easy to insure with the possibility of two groups of clips being active at the same time. By making a model of the diagram with the commutator cut out of card board separately, the card board commutator may be rotated by steps of 30 deg. each and the periodic closing of the circuit according to any sequence noted. It is obvious that with study the automatic feature might be arranged for other cycles, were they desired.

The middle drawing of Fig. 1 shows how the ratchet is operated every time the magnet above it is energized and the drawing at the right is an elevation with the cover removed to show the commutator and the practical form and mounting of the brushes. The front-to-rear section at the left gives an idea of the practical form of the commutator. The groups of switch clips are now mounted on the controller board, Fig. 3, though not in position when the photograph was taken.

In the group of switches shown in Fig. 4 are two pairs of push button switches, and all switches incidentally are ordinarily under lock and key. One pair of push buttons

double drum type operating balanced skips on an angle of 63 deg. from the horizontal. Each skip is designed to carry 17,500 lb. of ore, at a speed of 225 ft. per min., this being the rated capacity of the hoists. The hoisting machines are provided with drums 72 in. in diameter and the drums are driven by an internal gear of rolled steel with cut teeth, which is bolted to the drum flange, thus relieving the drumshaft of driving strain.

The drum gear meshes with a pinion of forged steel, integral with its shaft. On this pinion shaft is mounted a cast steel intermediate gear, which is in turn driven by a forged steel pinion on the motor shaft. The motor is of the direct-current type with steel frame, wound for 220 volts, and is of the Otis Elevator Company's own make.

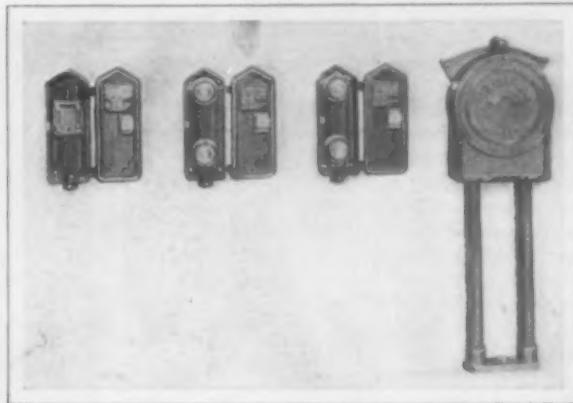


Fig. 4—Push Button Boxes and Master Switch

The service brake is of the steel band type, applied by spring pressure, and released by a powerful electro-magnet, the brake wheel being mounted on the motor shaft.

In addition, an emergency drum brake is provided mounted on the outside of the internal drum gear. This brake is applied either in case of excessive speed, or manually by the hoist operator, by the release of a weight, which in falling actuates a cam and applies the brake. The overspeed feature consists of a governor driven by the hoist, set to trip the weight at any predetermined increase over the normal hoisting speed. All gears are protected by heavy guards.

For the control of the hoists electro magnetic switches or contactors, capable of breaking currents of 1200 amperes, are employed. The automatic slowdown and stopping of the hoists is obtained by a heavy automatic switch mounted on the outboard drum stand, and driven, through protected gears, by the main drum shaft. The standard form of master switch is used by the operator, shown in Fig. 4.

The machines for opening the bells consist of Otis standard duplex worm and gear reductions driving forged steel throw cranks through heavy internal spur gears, which further reduce the speed of the operation. The machines are driven by Otis steel frame interpole motors of 35 hp. capacity, at 800 r.p.m. and heavy solenoid brakes are provided to accomplish quick stopping when the bells close. One revolution of the throw crank opens and closes the bell in the furnace top. The bells are counterweighted, in order to secure favorable operating conditions.

In addition to the foregoing, which constitutes the regular furnace equipment, a special skip hoist is installed at each furnace to remove the dust from the coke screens, as stated. These hoists are of the single skip uncounterbalanced type, and have the drums 6 ft. apart. This is due to the peculiar lead of the ropes, which, two in number, run from a cross bar on the bucket, then to sheaves at the top of the incline, and back to the drums. The machines, which are identical with those of the bell hoists, are located inside a shelter, and the drumshafts are carried through the wall, being supported by a wall bearing. The incline is 55 deg. from the horizontal, and the travel 68 ft.; the bucket weighs 2500 lb. and the load of coke dust 4500 lb. The control system is full automatic, the operator simply pressing a button to start the hoist; it then accelerates, runs at full speed until near the top, when it automatically slows down and stops, the skip bucket being in the dumping position. After pausing for 5 sec. to allow the load to fall, the hoist automatically reverses, runs the empty bucket down and places it at rest in the loading position.

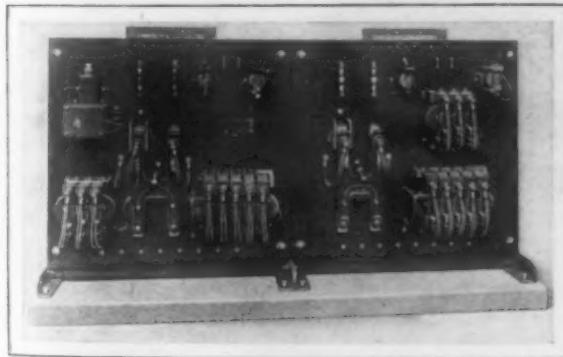


Fig. 3—Controller for Operating Both Bells on One Furnace

is for the small bell and the other for the large bell. Pushing the upper button momentarily causes the bell to operate once and the lower button must be pushed before another such emergency operation is possible. Another one of the switches shown in Fig. 4 is the extra load switch shown in the diagram Fig. 2. This is to allow for an extra skip load without destroying the automatic sequence between the bells. After the third or the sixth load has dumped and before the empty skip is started down, the switch is opened and after the extra load has been dumped and before the empty skip is started down again, the switch is closed. It should be added that in changing from one sequence to another, which requires merely the insertion of the switch knives in the proper set of clips, the commutator must be turned to the position corresponding to that taken in Fig. 2, a marker being provided to indicate when it is in the proper position.

The main hoists for serving the furnaces are of the

## A 10 1-2-In Vertical Shaping Machine

Recent Pratt & Whitney Machine for Both Slotting and Horizontal Shaping

A vertical shaping machine has been recently developed at the plant of the Pratt & Whitney Company, Hartford, Conn. The object has been to produce a machine that would not only be suitable for regular slotting machine work, but would also handle the line of work generally done on the horizontal shaping machine. To attain this end a number of new features, not generally found in a machine of this type, have been embodied in its construction. Among these may be mentioned the increased flexibility of the work holding mechanism, the use of a swiveling ram head and a rotary table and the providing of an angular adjustment for the ram. While the machine possesses sufficient power and stability to withstand severe service in manufacturing work, it is pointed out that at the same time it is a precision tool and can be relied upon as regards accuracy for the more delicate operations. In meeting the operating requirements, it is pointed out that the means employed have been located and constructed with a view to affording the machinist every operating convenience.

As will be noticed from the accompanying engraving, the rotary table forms an important part of the machine construction. It

is well mounted and the bearing surfaces, which are of large proportions, have taper gib adjustments to maintain the proper relations between them. Emphasis is laid upon the fact that with the use of this table it is possible to machine concave, convex or irregular surfaces. Another advantage which is claimed for this arrangement is that when working to a line, as in the manufacture of dies, the cutting tool always enters the work where the line is scratched. The diameter of the table is 24 in. and the longitudinal travel is 25 in., the transverse travel being 22 in. The work holding mechanism provided on this machine enables all internal operations to be performed on a piece at one setting, and this applies to a great extent on external work. In the case of an irregular shaped die punch, it is possible to finish the entire periphery at a single setting.

Both hand and power feeds are provided, and the entire feed mechanism is self-contained in a compact unit attached to the saddle at the right of the machine. The transverse, longitudinal and rotary feeds are controlled through the shaft A, the screw B, and the shaft C, respectively. The power feed is transmitted to the feed mechanism

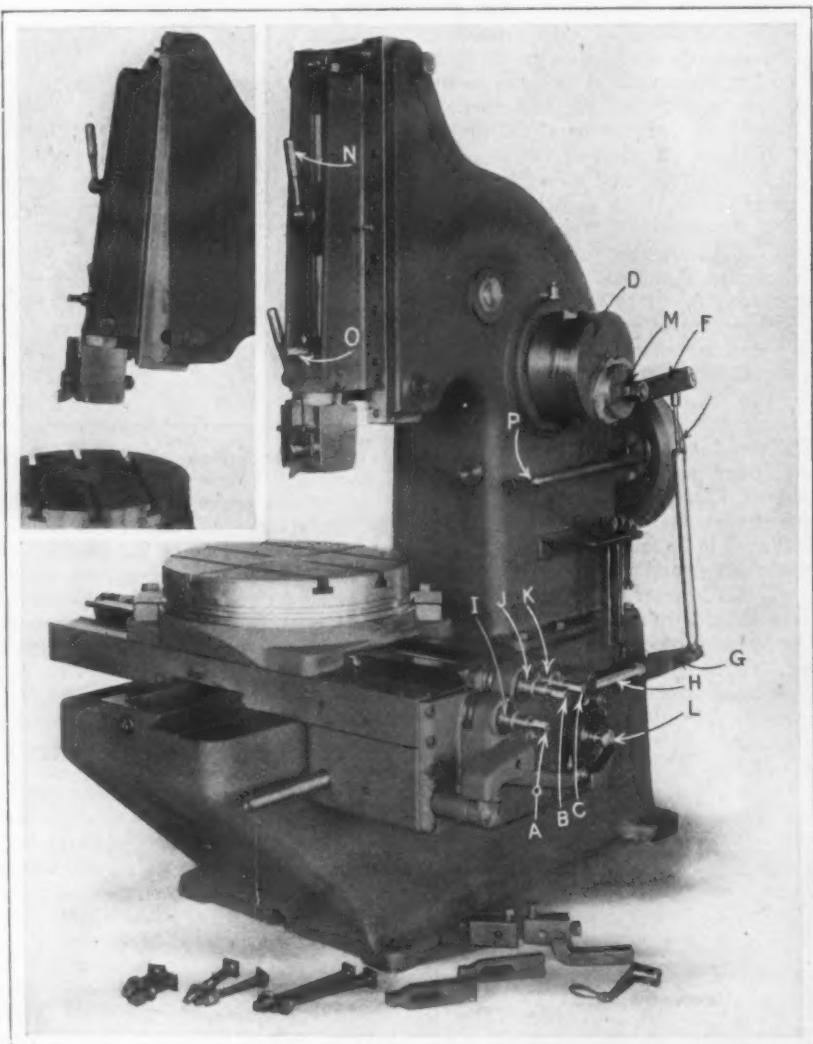
through the cam D, which operates the oscillating arm E, the desired rate being obtained by adjusting the shaft F in the oscillating arm. The power is transmitted through the crank G to the shaft H, and from there to the feed pawl and ratchet, which are clearly shown in the engraving. The several power feeds are engaged through the sliding pinions I, J and K, which are shown in the outward position, where the power feed is disengaged. These pinions are of such a form that they can easily be brought into the inward position for engaging the power feed simply by hand. The knob L, which operates a clutch, controls the operation of the power feed and is pulled in or out, according to the direction it is desired to feed. It is

pointed out that this mechanism gives a rapid action, which takes place when the ram is at the extreme upper limit of its travel. The tool, being clear of the work at this point, is not subjected to additional pressure on the return stroke. When hand feed is being employed, a crank wrench is used, the ends of the shafts being squared for this purpose. Micrometer dials are provided to control the various feeds, and the periphery of the rotary table is also graduated in degrees. The entire feed mechanism is inclosed and the various screws are protected against chips.

The ram driving mechanism is operated by worm gearing, and with this exception is similar in general design to that used on the company's horizontal type of machine.

The design is such as to counterbalance the ram, thus, it is pointed out, giving a free, easy running action. Four speed changes are obtained by a four-step cone pulley, and there is a quick return. It is possible to obtain any desired length of stroke up to a maximum of 10½ in. through the graduated dial M. The position of the ram may be changed by releasing the binder N and adjusting the screw through the shaft O. A friction clutch controlled through the lever P provides a means for starting and stopping the ram independently of the countershaft. The maximum distance from the table to the under side of the ram is 22 in. and from the table to the under side of the ram bearing the distance is 12½ in.

The angular adjustment provided for the ram is brought out in the little insert cut. This adjustment is made possible by mounting the ram in an independent bearing, the upper portion of which is pivoted on a trunnion that enables the bearing, together with the ram, to be swung on an angle, graduations in degrees being provided to indicate exactly the angle at which the ram is set. It is pointed out that this feature is advantageous on a great variety of work as the necessary clearance can be obtained.



A Recently Developed Vertical Shaping Machine with a Maximum Stroke of 10½ In. The Angular Adjustment of the Ram is Shown in the Upper Left Corner

In this machine a new type of tool post is used which does not project beyond the cutting edge of the tool, and in operation it passes directly over the work without interference. To accomplish this result, the tool is bound from the back, the customary set screw having been eliminated. The tool post is carried in a clapper, thus enabling the tool to clear the work on the return stroke, the same as in a horizontal shaping or a planing machine. The manner of mounting the clapper is such that the force of the cut is calculated to drive the clapper rigidly against the head. Where internal work is being done and exceptionally long tools are employed, means have been provided for binding the clapper solid to the head. The ram head can be swiveled to four different positions, which enables two or even four sides of certain work to be planed at one setting, this arrangement being relied upon to give absolute parallelism. In planing the different sides of work, the rotary table is clamped in position, two binders being provided for this purpose. The ram head is then swiveled to the desired position and either longitudinal or transverse power feed, depending upon the position of the ram head, employed. In this way it is possible to use short tools, and particularly on external work, where there is practically no overhang.

The net weight of the machine is 5700 lb., and it can be furnished with additional equipment, including a vise, set of small tools and holder for die work and positive stops for the transverse and longitudinal feeds.

#### Another American Builder of Diesel Engines

The McIntosh & Seymour Corporation, Auburn, N. Y., has been formed with a New York State charter to engage in the manufacture on an extensive scale of a full line of Diesel engines, both stationary and marine. The company will be backed not only by strong American interests, but also to a large extent by Swedish capitalists, who now control the Swedish Diesel Motor Company (*Aktiebolaget Diesels Motorer*), known all over the world as one of the largest and most successful concerns devoted entirely to the manufacture of Diesel engines. These engines are built on the Hesselman system.

The new corporation will take over the plant and organization of the McIntosh & Seymour Company, well known as a builder of steam engines of high grade. The present steam engine business will also be continued as heretofore. The board of directors is as follows: Marcus Wallenberg, president Stockholms Enskilda Bank, Stockholm, Sweden; Frank A. Vanderlip, president National City Bank, New York; Thatcher M. Brown, Brown Brothers & Co., New York; Edwin S. Church and J. A. Seymour, Auburn, N. Y.; Franklin B. Kirkbride, New York City; Oscar Lamm, Stockholm, Sweden, and Philip W. Henry, New York City. The general counsel is W. M. Coleman, New York City. Edwin S. Church, formerly superintendent of the Akron plant of the International Harvester Company, will be executive head of the new corporation. J. A. Seymour, president McIntosh & Seymour Company, will be vice-president, in charge of engineering. The initial capitalization will be \$2,200,000, half common and half 6 per cent. cumulative and participating preferred stock.

The Swedish Diesel Motor Company started to build these engines in 1898. Many of its designs of the most important features peculiar to the Diesel engine, such as the fuel pump, the atomizer, details of pistons, etc., have been purchased and adopted by many other leading builders of Diesel engines in Europe. Its chief engineer, K. Jonas E. Hesselman, although still a young man, has been knighted by the Swedish crown in recognition of his distinguished achievements in this line.

The McIntosh & Seymour Company in the past has run its plant night and day for many years, in the face of severe competition, with the most successful results. Its engines are installed in many of the largest steam plants in the country, besides which a large export business has been carried on to all parts of the world. These engines have made many notable records for economy, durability and small cost of maintenance, and have always stood for the very best in workmanship and design.

It should be remembered that notwithstanding the recent advance in the price of oil, the actual cost of fuel oil and its relative cost, as compared with coal, are generally much lower in the United States than in Europe; also, that oil suitable for Diesel engines is a by-product which will always be available in ample quantities as long as the present large consumption of gasoline and kerosene

exists. Many large new oil fields are also being developed in this country and Mexico.

Not only do Diesel engines offer many advantages for central station units, factory and other isolated power plants, and railroad service, but they are particularly desirable for marine work where weight and space saved are of prime importance. The Diesel oil engine eliminates the boilers with their necessary handling of coal and ashes; also pumps, and many other accessories characteristic of steam equipment. The space so saved and the coal-bunker space can be used for cargo, and the liquid fuel handled by pumps, and, requiring less than one-third of the room required for coal, can be stored in the ship's double bottom. In view of these facts, there seems to be no reason why there should not be a broad field in this country for this type of engine, especially when constructed under such exceptional conditions of experience and organization as prevail in a plant like that of the McIntosh & Seymour Company.

In addition to furnishing exclusive licenses for their valuable patents for the Western hemisphere, the Swedish interests in the new American company insure their active aid and co-operation by furnishing a large part of the working capital, and, furthermore, will take an active part in the actual building of the American engines.

#### International Motor Company's Affairs

Considerable publicity has been given to proceedings brought by a holder of preferred stock in the International Motor Company, asking for the appointment of a receiver and an injunction prohibiting the company from borrowing other funds. His application for a receivership and permanent injunction has been dismissed by the court. Officers of the company state that plans have been completed under which the existing or future merchandise creditors of the company will have unusual protection for credit extended. With the exception of bills for merchandise, it will have practically no obligations to meet for the next three years, beyond its current requirements.

The International Motor Company is one of the leading manufacturers of motor trucks, having, it is claimed, produced and sold more heavy trucks of two-ton capacity and upward than any other concern in the business. Its annual business has grown until it now reaches approximately \$4,000,000. It has just erected a most modern and efficient truck service station in New York City, on West End avenue, occupying the entire block from Sixty-third to Sixty-fourth street, representing an investment, with machinery, equipment, etc., of nearly a million dollars.

In his presidential address to the Birmingham (Eng.) Foundrymen's Association recently, C. Heggie discussed the use of plaster of Paris for making patterns for foundry purposes. The plaster, he said, should be mixed with water to the consistency of cream. He had found by experiment that from 10 to 12 parts by weight of plaster to 8 parts of water produced the strongest casts. The plaster should be shaken into the water in a large bowl, stirred gently, and poured quickly. Too much stirring weakens the plaster, as does the addition of more plaster or water after the mixing. Lime, size-water, ammonia, or sulphate of zinc can be used to retard the setting, lime-water being the medium most commonly used and added to the water before mixing. Lime and alum-water also strengthen the work, the latter however accelerating the setting.

As the result of a gift by which a complete refrigeration plant is being installed in the David Ranken School of Mechanical Trades at St. Louis, a course in refrigeration engineering is to be added at once to the curriculum of the school. The gift was made by E. H. Larkin of the National Ammonia Company, St. Louis. The school now has a registration of 511 in all its courses and is compelled to conduct both day and night classes to accommodate the enrolled students.

The Easton Car & Construction Company, which has purchased the good-will and plant of the Ernst Wiener Company, announces that its main office will be in the Northampton Bank Building, Easton, Pa., while its New York office, located at 30 Church street, will be in charge of C. R. Gier, formerly sales manager of the Ernst Wiener Company.

# German Use of Steel Ingot Molds

## Results Generally Successful—Re-carburized Basic Bessemer Steel the Best—Smooth Molds Preferred

The use of steel ingot molds has not developed in this country to the extent that it has in Europe, especially in Germany. In view of the fact that recently a large Southern steel company has entirely abandoned its experiments with and use of steel molds, an account of recent experience in Germany will be interesting. The results obtained there have varied at different plants, some having been very good, while others were not so promising. Steel Works Superintendent F. Amende, of Volklingen, is one who reports favorably in *Stahl und Eisen* for October 2. There were several cases where the molds stood more than 500 heats, and one where a mold stood 704.

Experiments were started in 1910, and Mr. Amende is astonished that further progress has not been made generally in the use of steel molds. It is true that they cannot be water cooled between heats like iron molds, so that considerable space is required to allow for air cooling, and this may be impossible for certain plants. At Volklingen there is unfortunately only cooling space for about 100 molds, so that water cooling has to be used. This means that a certain number of iron molds are still in service and there is the danger, especially on night turn, of quenching steel molds by mistake. This has been known to happen in isolated cases, perfectly good molds being found next morning with long vertical cracks. The steel charges average about 42,000 lb. and give five ingots, about 8400 lb. each. Four of these are bottom poured and either the first or fifth top poured, so that the question whether steel molds can be used successfully for top pouring is readily answered. Care must be taken of course that the stream of steel does not continuously strike the sides of the mold, but even then a steel mold is not more sensitive than an iron one.

### Kind of Steel to Be Used

In regard to the kind of steel to use, extensive tests have shown that material of about 70,000 lb. per sq. in. gives the best results. Soft steel with some silicon additions stood about 150 heats, so that these molds were not satisfactory. The same applies to molds made of material approaching rail steel in composition, though not to such an extent. Further tests with such steel, containing about 0.40 per cent. carbon, might give good results. A great advantage for steel molds under German conditions is that basic Bessemer steel, re-carburized with ferromanganese or spiegeleisen, provides excellent material for them. Care must be taken that the steel used sets absolutely quiet, and the blown metal should be allowed to remain standing two or three minutes in the converter. The rest of the charge, after pouring three or four molds one after the other, can be used for ordinary steel castings. At Volklingen the steel foundry was intended to be used only for the production of molds, but they stood up so well that now the 14 molders have spare time and are also employed on castings for use in the plant.

Concerning the making and handling of the core and cope the following may be said. From the beginning, the same cast-iron cope has been used as when making steel molds. It is lined with fire brick on which molding sand is laid about  $\frac{3}{4}$  in. thick. The whole is then very thoroughly dried, either in a drying oven or by being surrounded with red hot molds. Then comes finally the application of the facing. In making the core the usual solid cast-iron spindle is used, which first receives its coating of straw. The sand is then laid on in layers, each layer being thoroughly dried. This careful building up of the core has proved very good. Finally, as in the case of the cope, the facing is applied. After setting the core in position, and getting ready for pouring (bottom pouring is used), the whole is again surrounded with hot molds to thoroughly heat them through. The corners of the core spindle must be rounded so that the thickness of the sand is about the same all over. After pouring the molds, the whole is left for two or three days, so as to promote very gradual cooling. It may be called flash annealing.

### Smooth Molds Give the Best Results

Experiments have been made with molds having longitudinal ribs on the outer surface, but the smooth mold has given the best results and is now being used exclusively. Up to April 21, 1913, the number of steel molds in use was 139. They are called 8800-lb. molds, though the actual weight is 8400 lb., about 400 lb. lighter than the corresponding iron molds. The records of the molds replaced in 1912 were as follows:

No. of mold	Heats	
3	432	
4	520	
6	470	
1	584	Made of electro-steel
1	464	
2	704	
10	378	
12	154	Rail steel
14	51	Soft material
19	203	Rail steel
24	182	Soft material, with 0.07 per cent. C., 0.50 Mn., 0.07 Ph., 0.07 S.
25	26	Soft material, 0.08 per cent. C., 0.55 Mn., 0.095 Ph., 0.090 S. Steel was wild and boiled.
15	336	Rail steel
18	229	
20	195	
5	116	
11	97	Very large cracks. Tests with varied material
28	119	
48	74	
50	136	Very large crack. Cause unknown

In 1913 the following were scrapped:

No. of mold	Heats	No. of mold	Heats
16	262	8	682
26	406	34	405
32	392	17	357
27	303	36	337
33	257		

Those given below are still in operation:

No. of mold	Heats	No. of mold	Heats
7	347	38	348
9	484	39	376
13	630	40	334
15	363	41	350
21	363	42	346
22	575	43	315
23	399	44	338
29	359	45	329
30	444	46	318
31	409	47	317
35	336	49	409
37	346		

The other molds, with numbers from 51 to 139, are still in operation, varying in numbers of heats from 374 to 39 with No. 139. For 1912 the average number of heats from the 20 molds was 273, and for 1913, up to April 21, the result was much better, having shown an average of 378 heats for the nine molds replaced. One mold is excluded from the 1913 showing. It only showed 42 heats and was spoiled by barbarous treatment. The flasks and core spindles show no signs of wear.

The cost of the steel molds per metric ton (2204.6 lb.) is:

Molders' wages .....	6.25 marks
Special costs .....	17.48 marks
Steel plus 6 per cent. loss.	67.27 marks

91.00 marks (\$21.41)

The special costs include administration expense, depreciation buildings, new crane, electric power and light, etc. The total cost of 91 marks should be considerably reduced as experience is gained. Mr. Amende concludes by saying that they have no regrets regarding the change from iron to steel molds.

### Discussion

There was considerable discussion of the paper in which it was brought out that certain plants had not obtained satisfactory results with steel molds. At the Königshütte, however, the number of heats averaged 290, compared with 174 and 142 for iron molds in the basic Bessemer and open hearth respectively. This was with smooth surface molds, when longitudinal and transverse ribs were added the number increased to over 400. The steel used contained

0.25 to 0.35 per cent. carbon with 0.70 to 0.90 per cent. manganese.

At Remscheid steel molds are standing up well for ingots of 200 to 600 lb. of high-grade steels, the number of heats being 1000 and over. At Ruhrt the molds only stood 50 to 60 heats. They did not crack, but the section was distorted so that the ingots could not be stripped. This was also the case at the Borsigwerk, where slab ingots only were poured, so that the conclusion is suggested that steel molds are only suitable for square ingots.

Mr. Amende replied that distortion gave them no trouble at Volklingen, only the cracks. The results at Gutehoffnungshütte were also unfavorable, although air cooling was used. This was about three and one-half years ago, and unfortunately there had been no time to renew the experiments. Mr. Amende said that his molds were made with a casting head of about 12 in. When in use the molds were heated to a clear red by the steel. The walls were 4.3 in. thick, even all around, except that they were a little less at the corners.

G. B. W.

### A New Form of Water-Tube Boiler

A water-tube boiler interesting in respect to the arrangement of the tubes has been brought out by the Morrison Boiler Company, Sharon, Pa. Special emphasis is laid upon the fact that any tube in the entire boiler can be removed without injury to any other tube, or without the displacement of baffles or brickwork. Freedom of circulation and minimizing radiation losses were two points given special consideration in the design of the boiler.

The boiler proper or the steam generating part consists of round, plain drums, such as can be made or repaired in the average boiler shop. These drums are connected with vertical tubes, which are arranged from wall to wall to give passages of equal area for the travel of the gases. Large alleyways and special baffle bricks are done away with, the boiler being baffled by 9-in. walls. The combustion chamber is not placed at the side of the drums, but is located at the end, so that the circulation of the boiler passes longitudinally over the drums. The boiler proper is entirely inclosed within the brickwork of the setting, and there are only a few doors, this construction being relied upon to cut down the losses by radiation.

With a view to reducing the cost of maintenance and repairs, the tubes have been arranged so that any one can be removed without the necessity of removing other tubes or baffle work. This result is secured by staggering the

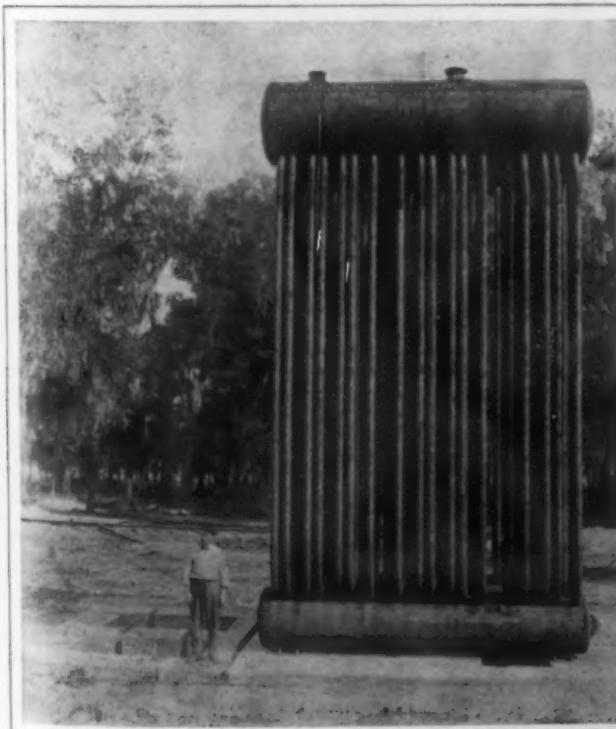
two intermediate rows in each bank with the center row, while the two other rows are arranged in a series of narrow and wide spaces, the wide openings in one outer row alternating with those in the opposite outer row. In this way, it is possible to remove the tubes in the center row alternately through right and left spaces, and the tubes in the intermediate rows can all be removed through these same spaces.

The boiler illustrated was installed at the plant of the National Pulp & Turpentine Company, and is of the five-row type. With larger units there would be more rows and longer drums.

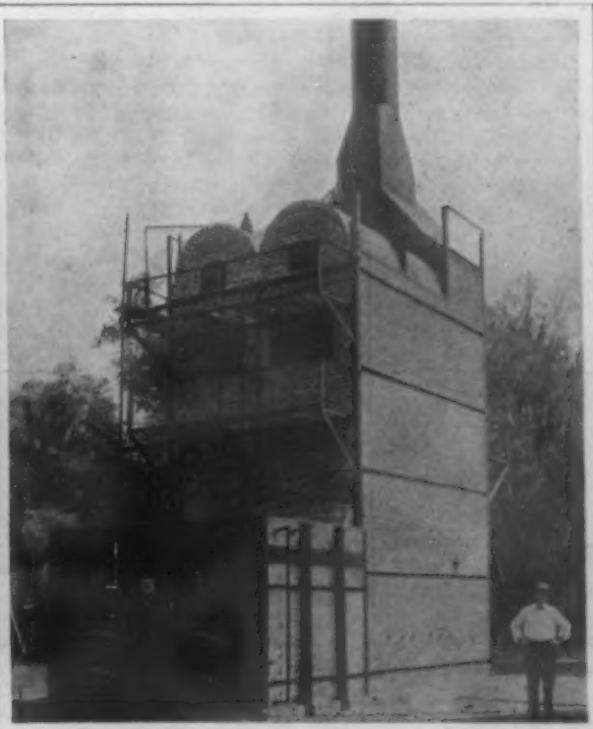
### Westinghouse Marine Turbines

Inquiries and negotiations for the application of the Westinghouse marine turbines and reduction gear to ship propulsion have been so many that the Westinghouse Machine Company, East Pittsburgh, Pa., has been compelled to add to its organization a marine department for the purpose of handling this line of business. A corps of engineers has been engaged for this work, with Charles B. Edwards, formerly chief engineer for the Fore River Shipbuilding Company, as chief engineer. At a recent meeting of the executive committee of the company, H. T. Herr, vice-president and general manager, stated that the demand for the marine system of the company had assumed proportions that gave every indication that within a short time it would develop into one of the largest and most important branches of its business. For the manufacture of this line of machinery, the shops are being provided with the requisite facilities which are essential in the construction of this style of apparatus.

With the opening of the Panama Canal, the marine construction business of this country is expected to experience a great revival, thus expanding the market for ship-propelling machinery. A large share of this business is expected by Westinghouse Machine Company, because its system of ship-propulsion, consisting of the Westinghouse marine turbine and the Westinghouse-Melville reduction gear, as well as the bridge control device, is thoroughly modern in marine engineering and construction. Like all Westinghouse productions, every feature of this system has been thoroughly tested; various ships have been equipped and have been in successful operation for some time. It is confidently expected that the company, by entering this field of manufacture, has established a new and important industry in Pittsburgh.



Side View During Construction



Front View of the Finished Boiler

TWO VIEWS OF A RECENTLY DEVELOPED WATER-TUBE BOILER

S. DIESCHER & SONS.

Mechanical and Civil Engineers,

PITTSBURGH, PA.

## The Proposed Currency Legislation\*

A Plea for Intellectual Freedom, by a  
Former Assistant Secretary of the Treasury

BY F. A. VANDERLIPT†

There are some laws in this world that are more potent even than laws enacted by representatives of a sovereign people. We are in a time when many believe that we can legislate equality of opportunity and reward; that we can by mere enactment alone bring comfort and prosperity.

Still probably all perceive that there are some laws of nature that are unbending even in the presence of legislative edict, that if we pass legislation that does not conform to such laws the result must only be to show the futility of such legislation.

There are as definite laws of economics as there are of health or mechanics. Those laws are not as universally understood, but they are none the less real, none the less certain in their operation. A party caucus cannot change them, nor can a majority vote of a hundred million people. Party platforms or committee reports are mere words that will patter ineffectually against natural laws if not in complete harmony with them.

### Problem Not One to Be Settled by a Caucus

A correct solution of this problem of banking and currency legislation can be found only through our intellects; it will never be reached through remembering old prejudices or new platforms. It is not likely to be solved correctly by a party caucus, nor through the aid of an administration whip. An intellectual study of how to formulate a legislative measure which will conform to principles of economics, a search of our own consciousnesses for what is honorably due from one citizen to another, from one community to another, an appreciation of the truth that sound legislation will bring a prosperity that will compensate for some immediate hardships and losses, occurring during the period of transition from an established, though bad system to a correct if necessarily somewhat experimental one—these are the guides that point the road to successful legislation.

I have no personal apology to make, either for being a banker or for being a Wall street banker. I decline to accept silently any classification of bankers as discredited citizens. I refuse to be so classified and I particularly refuse to be cut out from participation in the discussion of public questions or from offering such humble service as I can toward the solution of public problems. I am deeply grateful to the Senate Committee for having given me an opportunity in that direction.

What does this cry of government by the people really mean? Who are the people? Are not my associates and am not I one of them? I stand charged with the offense of being president of the largest bank in the United States. Who are the officers of that bank? Let me tell you that with a single exception they are men whose boyhood started in poverty. I myself wore the blue overalls of a farm hand and a machine-shop apprentice. One of our vice-president's memories of boyhood begin as a cotton picker in the fields of Louisiana; another as a teacher in a country school in Kansas; another as a newsboy on the streets of Chicago. I could go through the whole list and tell you of the most humble beginnings, the greatest sacrifices, of fidelity to duty and of improvement of opportunity that have served to separate these men from others who started as they did but who are instead ending not far beyond the starting point.

### Advice Needed of Men Who Have Been Successful

I have cited the bank with which I am connected because it is a case which which I am intimately familiar. In general terms, however, the same may be said of every bank in New York City, or pretty much anywhere else in the country. In such a technical and intricate matter as banking and currency legislation, do you want the advice of men who have started in most humble surroundings and remained there, or of men who in spite of every handicap have surmounted the barriers and have made a success of life?

\*Extracts from an address delivered before the Economic Club of New York, November 10, 1913.

†President National City Bank of New York.

We all know there is need for a bank or banks of rediscount, so that commercial paper, which at present goes into a bank's portfolio and lies there financially inert until maturity, may be made liquid through an unfailing ability to rediscount it. That has been recognized and provided for in the House bill. We need mobilization of reserves and the creation of a single reserve reservoir, or several reserve reservoirs, so related as to operate in fact as if they were one. That has been recognized in the House bill and in part provided for. We need a currency, the volume of which will be responsive to the demands of business. That has been recognized and provided for, although there has been attached to it an unnecessary and dangerous Government obligation. We need a rearrangement of our bank reserves so that they will not multiply and pyramid in a way that is both uneconomic and dangerous, but will be gathered into a reserve institution which will administer them wisely, justly and equitably for the welfare of the whole commercial community. That necessity has been recognized and the machinery for accomplishing it set up in the House bill. Over the new system thus created we need a wise, intelligent, experienced administration that will neither be subject to the violent changes of political thought nor to the machinations of individual or community interests. That principle has been recognized by the drafters of the House bill, but they saw dimly when they undertook to embody it in the measure.

### House Bill Defective as to Nature of Currency

I will try to outline in what respects it seems to me the bill as it has passed the House fails to square with economic principles, although those principles were in the main clearly in the minds of the men who drafted the bill.

To my mind the most serious defect is to be found in the nature of the currency which this bill authorizes. That defect, however, does not lie in the fact that the currency fails to conform to those principles which should govern an elastic note issue. It is more fundamental than any of the principles which I have been discussing. The currency is, in fact, a fiat money issue. Sound safeguards have been thrown about the banks to which the Government proposes to loan these fiat notes, but they are none the less fiat in character, having no gold cover and no adequate means of redemption provided so far as the Government itself is concerned. Safeguards are thrown about their issue which in effect makes them bank notes after they have reached the hands of the bank. That is what they should be and that is all they should be. So far as the working of a banking and currency measure is concerned, the fact that the note is the obligation of the Government and is made redeemable by the Government will not destroy its elastic quality as a bank note. We might go on under such a system for a long time without experiencing any evil in it. That very fact, however, would lead the general public to see that currency turned out by a Government printing press and loaned to a bank to be reloaned by them seemed successfully to be performing all the functions of money, and there will certainly be a political faction quick to demand a short cut by way of the loaning of such money direct to the people without the intervention of a bank. There is danger in the Government assuming this unnecessary obligation, but the really grave danger lies in leading the public to accept the fallacy that the Government can print paper for which it provides within itself no metallic means for redemption, and have that paper successfully perform all the functions of a proper circulating note.

### The Principle of Regional Banks Defective

We all agree that the present method of holding bank reserves is bad. We all agree that we should do away with the evils of pyramiding reserves and have all reserves kept in part in the vaults of the individual banks themselves and in part in a reserve bank or banks organized to hold these reserves and to grant rediscounts upon commercial paper.

Sentiment, then, divides itself as to whether there shall be one reserve reservoir with many branches, or numerous reserve reservoirs co-ordinated through a central power. To one who has not the principles clearly in mind, the difference may not seem to be a distinction of

importance. The House bill, as you all know, proposes twelve independent regional banks, the stock of which the existing banks in the several districts will be compelled to subscribe for, and permanently hold. The underlying thought here seems to be to get away from centralization, to keep so far as possible the reserves of a district within that district and to minimize the importance of the great financial centers. Whether or not those purposes are laudable, I will not undertake to discuss, but I do say with a feeling of complete assurance that if these are the ends sought, the framers of the House bill have missed the mark. The result will not be to accomplish what they wish. To have twelve regional reserve banks means to have several with a capital little if any more than the minimum of \$5,000,000 each. The bank which I represent controls an aggregate of \$70,000,000 of banking capital. There are other banks approximating that banking power and many that would be larger than the regional banks if twelve of them are set up. The creation of twelve regional banks, then, will not tend to minimize, but rather to emphasize, the power of large institutions. Great public institutions, though they are designed to be, they will represent less financial strength than individual institutions.

There is another objection to the twelve regional banks that is of much deeper significance, however. The whole theory of centralized bank reserves is based on the idea that there shall be consolidated in one reservoir the reserves of banks operating under diverse agricultural and industrial conditions, meeting a borrowing demand that is not general but special, so that the plethora of funds in one community can be made available to meet the lack of funds in another. If twelve regional districts are created in this country, they will of necessity be so small that in several cases at least there will be typically similar conditions prevailing throughout an entire region at the same time.

#### Regional Banks Too Small to Be Effective

Let us take for example a regional bank located in New Orleans. The district in which that bank would operate would comprise a great cotton growing section. Climatic and crop conditions could be practically the same throughout the district. It would follow, as experience clearly shows has been the case, that practically all the banks in that district would feel an identical pressure at the same time. Thus none of the advantages of centralized reserves from banks operating under varying conditions would be realized. The resources of that bank would be soon exhausted, because all the member banks would be in need of assistance of the same character at the same time. There is an economic principle involved in the number of regional banks. It is not a matter to be settled by adherence to a political doctrine. It is a subject for intellectual judgment and not one to be settled correctly by merely a show of partisan strength.

The framers of the House bill really see this point, and so they have given power to the Federal Reserve Board to compel one regional bank to loan to another. Perceiving that to be a dangerous and obnoxious power, it has been hedged about so as to make it ineffectual. Obnoxious as I regard such a power, I still recognize that the necessity for creating in effect a single reserve reservoir is paramount, and if there are to be numerous regional banks there must be unrestricted power given to a supervisory authority to compel banks to loan to one another.

The House bill creates the capital for the regional banks by forced subscription from existing national banks. Each national bank is compelled to subscribe 20 per cent. of its capital, paying up half of that amount and remaining under liability to pay the remaining half. Having subscribed to the capital, it must keep the stock inert in its portfolio. It is a type of the worst form of investment of a bank's funds, for it is an investment that is absolutely unliquid. More than that, the compulsion of banks to make an investment of this or of any other character is unsound.

#### The Character of the Governing Board

The central governing authority must of necessity be given the largest sort of powers if a system of regional banks is to be made workable at all. The character of that central authority, therefore, becomes of great moment.

That a management of this sort should have continuity and experience and should be as free from political pressure as from the danger of serving private interests would seem to be axiomatic. The House bill provides for a board of seven, three of whom are ex officio members, coming from the executive's immediate official family. One, the Comptroller of the Currency, is the subordinate of another, the Secretary of the Treasury. The Comptroller of the Currency bears a peculiar supervisory relation to all the national banks, and would be placed in a most undesirable double relation to the banking situation by such an appointment. The regular members of the Federal Reserve Board are appointed for comparatively short terms, and the bipartisanship of the board is insured through the specific provision that not more than two shall be of the same political party. The lack of emphasis upon experience is shown in the further provision that one member of the board shall be a person experienced in banking.

Here, then, are the grounds where sharp division of opinion are displayed—the character of the note issue, the number of regional banks, the compulsion of existing banks to subscribe to the stock of the new banks or surrender their charters, and the nature of the central control. The ground of differences is narrow enough to permit thorough discussion and a comprehension of the reasoning supporting each view by anyone who cares to study the subject.

In the case of the note issue, I am of the opinion that a sufficient faction of the dominant party so strongly believes that the Government should control the volume and issue of all currency that there are not good grounds to hope that legislation can be secured with the present constitution of Congress which will provide for a true bank note. On the other points of difference, it seems to me that the reasons for amending the House bill are so cogent, so easily comprehended, so far from being political on the one hand, or representing merely the selfish wishes of centralized financial power on the other, that it ought to be easy to reach a conclusion based on intellectual judgment alone. Several members of the Senate Committee on Banking and Currency I know are of that opinion. They believe that a measure can be drawn which will square with economic principles and will still meet all the essential tenets of Democratic faith. They did me the honor to ask me to attempt to devise such a plan.

#### Suggested Plan for a Central Bank

The plan that I presented was for a central bank, the stock of which should be freely subscribed for and owned by the people, and the management of which should be solely in the hands of the Government. I by no means lay claim to this as my personal plan for legislation (although it has my approval) and I deeply deprecate that my name has become attached to it, if there is such a prejudice against any banker-made plan that it cannot be considered on its merits.

This plan for a central bank contemplates the creation of an institution with a hundred million dollars of capital, the stock of which should be tax free and bear 5 per cent. dividends, and be offered to the public. I believe it would be eagerly taken by the public and that it should be allotted to the smallest subscribers first. This would create an institution, the capital resting on a free public subscription, rather than a compelled and unwilling bank subscription. The Government would have all the earnings above the dividend requirement, and the surplus above the dividend requirements should be devoted to the retirement of the Government debt. I would give to this stock no power of any sort, voting voice or otherwise, except the power to receive dividends. The management of the institution should be solely in the hands of a board appointed by the President, but that board should be as free from political and partisan influence as from private influence. I would, therefore, have no ex officio members, but rather a board with life, or at least long-term, appointments. I have suggested a board of seven, with terms of fourteen years, the term of one director expiring every two years. This would make it possible for a President to change the majority of a board only by the end of his second term, unless there were other than normal vacancies, or by removal of a director for cause to be stated to the Senate. This central bank would have as many

branches as might be needed to accommodate the business of the country. The principle which prohibits numerous independent regional banks would in no wise operate against numerous branches of a central bank. Every city of importance could be provided with a branch or a sub-branch of such an institution, while to create as many as twelve or indeed fewer than that number of independent regional banks is such a violation of an economic principle that nearly all the benefit of the attempted mobilization of reserves will be lost. I would have a bank note currency issued solely as the obligation of this central bank. As the bank would be controlled by public officers from the governor to assistant janitor, notes issued by such a bank would still be in perfect accord with the political principle that the Government must control the volume and issue of currency, but notes issued by such a bank would be open to none of the objections of a fiat issue of Government currency to be loaned to regional banks.

#### Nothing in Business Situation to Demand Immediate Action

I know that the opinion is held in some quarters that I have projected this plan for a central bank into the situation with a view to confusing political action. I deeply regret that anyone can hold such an opinion, for nothing could have been further from my intention. The plan was prepared because three members of the Senate Committee desired me to prepare it. It was the intention to hand the plan to these members of the committee and in no way to connect myself with it. I was offered practically no alternative but to go before the committee and elucidate the plan. I did that with regret, because I understood clearly enough that my connection with it would create a political difficulty in the way of its adoption. Instead of wanting to confuse and obstruct legislation, I have the deepest desire to aid and facilitate it. For years bankers have been almost the sole advocates of just the sort of legislation that it is now hoped we will have, and it is unfair to accuse them of being in opposition to sound legislation. I believe it would be desirable to have legislation completed at this session, but it is far more desirable that legislation should be sound than that it be merely immediate. There is nothing in the business or financial situation that demands immediate action. There is much that demands action in conformity with economic principles.

Could I speak directly to the President of the United States, I would feel, considering the present position of this legislation, that it was one of the most solemn and important opportunities I had ever faced. I would say to him that the country owes to him unbounded praise for the stand he has taken for currency legislation. Without that positive determination, without the grim will that he has shown, legislation at the present time would be impossible, and there is due to him for his courage, his persistency, for the strength of his political purposes, unstinted praise, but I could not stop with saying that. I would say:

#### A Direct Appeal to the President

"Mr. President, the history of this country, with which you are so familiar, presents few examples of greater responsibility resting upon its chief executive. Tariffs, tax schemes, or even wars themselves may affect only members of the body politic, its hands, its arms, but banking and currency legislation affects its heart. It reaches every citizen, humble or great, rich or poor, and the measure that history will make of your acts will be largely influenced by the success or the failure of the legislative programme which you are now with your splendid will imposing upon the country. We need legislation, but that legislation must conform to higher laws than any man or set of men can make—to the laws of economics. Those laws are greater than party platforms, they are greater than any administrative programme, they will work undeviatingly whatever legislation you write upon the statute books. There can be no time limit beyond which you cannot change a legislative plan if by such change you will more nearly conform that plan to these higher laws. There is nothing in the financial situation that need give you cause to hurry if by taking time for deeper consideration and for better understanding your proposed enactments can be improved. The enactment of new banking and currency laws may be made a short ceremony, but that

enactment will have endless consequences for good or evil. I beg of you not to close your mind to argument that is based on an understanding of principles, nor to let your judgment be clouded by partisan pride or the hope for partisan advantage. You may proudly say that you do not write your political programme in chalk, but if that programme is found by experience not to square with sound economic principles its indelibility may some day be your deepest regret. You have earned the gratitude of a great people by bringing through your force of will this legislative programme up to the present point. If you will now throw the tremendous weight of your influence on the side of free intellectual judgment and against the brute force of party majorities, if you will throw the great weight of your influence in a direction that will lead to an exercise of freedom of thought without political restriction, if you will see to it that decisions may be made upon the economic merit of the proposals and not be tied and hampered by party domination, you will then have earned lasting praise. Do not again permit the intellects of the men who must decide this great question to be bound and hampered by caucus rule. Do not permit partisan pride to stand in the way of achieving what is right. See to it that there is free play for the sound and unhampered judgment of Congress, and then you will indeed have brought to this country a new freedom."

#### Last of the Anthracite Blast Furnaces

Three of the furnaces of the Thomas Iron Company are now in blast, the second of its Lock Ridge furnaces at Alburtis, Pa., having been blown in on November 3 to take care of an order which can be more advantageously shipped from that point. At Hokendauqua one of the company's 250-ton furnaces has been steadily in operation for a good many months, while another has been out since May for extensive repairs, though work on these has been stopped for the present. The two furnaces at Alburtis use anthracite as fuel and are probably the only furnaces in the country operating on anthracite exclusively, though a number of eastern Pennsylvania furnaces use mixed anthracite and coke. In the first half of 1913 the production of pig iron with anthracite alone amounted to 11,491 gross tons, as compared with 10,054 tons in the last half of 1912 and 658 tons in the first half. The production of pig iron with mixed anthracite and coke was 225,665 tons in the first half of this year, against 171,468 tons in the second half of 1912 and 64,909 tons in the first half. The largest production of exclusively anthracite pig iron in any year in the past ten was in 1903, when the total was 47,148 tons. In the same year the mixed anthracite and coke iron production was 1,864,199 tons, though the percentage of anthracite in the fuel mixture was presumably very small.

#### Enforcing Ontario Boiler Regulations

A Canadian journal publishes the following statement regarding the enforcement of the boiler regulations adopted by the province of Ontario:

Early efforts on the part of manufacturers to avoid the provisions of the stationary boiler regulations adopted by the Ontario Government last July have apparently dwindled away. Yesterday application was made to the boiler inspection branch by the firm of Baldry, Yesburgh & Hutchinson, of London, England, and St. Catharines, contractors for the second section of the Welland Canal, to have an inspector sent to England to examine twenty-five boilers which this firm is bringing out in connection with its plant.

Since July 1 some 450 designs of boilers have been approved by the department, and applications have been received from many firms in the United States to have their product tested in cases where local manufacturers or contractors have gone to New York or Pittsburgh to purchase a boiler suited to their requirements.

L. C. Taylor, Cambridge, Ohio, representing the bondholders of the Union Sheet & Tin Plate Company, Norwood, Ohio, has purchased the plant, buildings, etc., for \$65,000, of which \$50,000 was in bonds and the remainder in cash. It is stated to be the intention to begin the operation of the plant at once.

# The National Founders' Association Meeting

## Method of Combatting the Erie Strike, Experiences Under Workmen's Compensation Laws and Definite Progress in Standardizing Safeguards, Features of Last Week's Meeting

The meeting of the National Founders' Association held last week in New York City, November 19 and 20, brought out strongly the conflicts of the past year to maintain the open shop, focussed anew on the imminence of one-sided legislation through fear of organized labor on the part of the law-makers, threw the limelight on the flood tide of undiscriminating sympathy for the apparent as well as the really weak and downtrodden, pushed a large step forward in the matter of standardizing means and methods of safeguarding life in the industry and collected considerable information on the practical working out of workmen's compensation measures. In brief, the meeting served again to bring out a year's developments in the problems of owning and operating a foundry and to point out the needs and direction of future efforts. It marked also the termination of the connection of O. P. Briggs as president, who had at last prevailed on the nominating committee that he be allowed to give the attention he desired to his personal business interests, a desire which the nominating committee admitted at the meeting of 1912. He was succeeded by William H. Barr, Lumen Bearing Company, Buffalo; and Otto H. Falk, the Falk Company and the Allis-Chalmers Mfg. Company, Milwaukee, was elected vice-president.

The meeting was held in the Hotel Astor and as usual opened on Wednesday morning, convened again in the afternoon, banqueted Wednesday night and held a concluding session on Thursday morning. The accustomed informal dinner-gathering of the so-called alumni, comprising past and present officers and members of the administrative council of the association, occurred Tuesday night with a large attendance, some 40 odd being present.

The reports of the officers given immediately below indicate the activity of the association in regard to strikes and one particular independent contribution on this subject was made by Thomas E. Durban, Erie City Iron Works, Erie, Pa., outlining quite completely the methods

which have been adopted by the employers in Erie in a strike of more than local importance. Mr. Durban's address is accordingly reviewed at length later in this account. The reports of the association's legislative representative in Washington and the association's attorney were further illuminating with regard to the activities of organized labor in framing legislation in its particular interest and urged therefore continued vigilance on the part of employers to prevent enactment of class legislation. Associated with this topic was an exhortation by Henry M. Leland, Cadillac Motor Car Company, and a speech at the banquet by the Rev. M. D. Shutter, Minneapolis. Mr. Leland emphasized particularly the misrepresentation of the condition of the factory worker and of the farmer, the one promulgated by the general periodical press which is pandering to the masses by gross exaggeration for the sake of circulation, and the other taken up as has been his wont by the politician for holding votes. The Rev. Mr. Shutter dwelt on the lack of social justice accorded to the employer, who is forgotten in the efforts to relieve the situation of the employed. The movement for standardizing safeguards was given a decided impetus by M. W. Alexander, General Electric Company, West Lynn, Mass., who as chairman of the committee on the subject appointed as a result of the plea he made at the last annual meeting, told of the truly remarkable accomplishments of his committee, particularly in regard to goggles, molders' shoes and leggins, safety signs and the preparation of literature on safety and sanitation. The practical workings of workmen's compensation acts in Illinois, Michigan and New Jersey were listened to with close interest and the reports are admittedly of high importance in shaping amendments to existing law and in directing law in process of writing in States where the subject is under consideration. These reports were presented by Staunton B. Peck, Link-Belt Company, Chicago; C. H. Gifford, American Blower Company, Detroit, and H. P. Macdonald, Snead & Co. Iron Works, Jersey City.

## The Present Attitude and Activities of Organized Labor

The reports of the president, commissioner and secretary all covered to a great degree the problems involved in connection with organized labor, and following them may be found the special reports on some specific strikes:

### Report of Retiring President Briggs

President Briggs, in his report as president, reviewed the decade of the association's history covering his official connection, seven years of it as president. It is in part as follows:

The 1903 convention marked the close of seven years' experimenting as to what the policy of the association ought to be. After an honest, straightforward, energetic effort on the part of the officers of the association it was plainly evident that the attempt to deal with the Iron Molders' Union in a manner satisfactory to it, namely, the purchase and sale of its labor in a collective capacity, was a complete failure and what we were to do under the disturbed conditions was the problem of the hour. The solving of this problem was the work delegated to the council and officers elected at that convention.

What has been accomplished is that we have obtained for those members who have asked assistance in getting relief from unjust union restrictions:

- (a) Removal of the Iron Molders' Union limitation of apprentices;
- (b) Removal of its limitation of a molder's output and his earning capacity;
- (c) Removal of its minimum wage rule;
- (d) The creation of a condition whereby the molding machine and other improved foundry appliances have been introduced to an extent far beyond the expectation of the most optimistic manufacturer.

I believe I am safe in saying that more progress along

the line of improved appliances has been made during this 10-yr. period as the result of the opportunity to apply the fruits of invention and ingenuity than has been made during the 75 years preceding it.

### Cost of and Procedure in Combatting Strikes

As to the cost in money value, I am confident that a careful analysis of the expenditures will prove that these results have been obtained for a surprisingly small amount. Prior to the advent of this open-shop policy, the defense of a member in trouble cost an enormous amount of money. Comparing the record of the Cleveland strike, when thirteen shops, employing 416 molders, were defended, with the strike of 1906-1907, when 60 shops scattered over many different states, and employing 2959 molders, were defended, the cost per molder in the two cases was as 6.25 to 1. Comparing with the bitter strikes of 1912-1913, you will find that to defend 42 shops, employing 1486 molders, cost less than one-tenth as much per molder as in the Cleveland strike. This difference in expenditure of money, with the corresponding amount of energy, is due directly to the following methods of defense adopted in 1904 and 1905:

(a) Profiting by its experience up to 1904, the association adopted a written, well worded contract with the member whose shop is struck, defining clearly in this contract what each party is to do, and what each party is to receive. Every shop supported from that time until this has signed one of these contracts.

(b) In 1904 the association adopted the plan of hiring under yearly contract a certain number of highly skilled men to act as instructors and educators whenever their services were required.

(3) Owing to the experiences of the same period the association inaugurated a secret service department, which has assisted in times of trouble to an extent impossible of calculation.

With these three mediums of defense so thoroughly organized and equipped, the matter of defending a shop in trouble has become a question of routine work, the entire organization applying itself instantly like a huge machine. Whenever a strike occurs and a member asks for assistance, the officers of the association know at once just what is to be done, and just how to do it.

As evidence of the perfection, promptness and ease with which this organization acts in case of strikes, I call your attention to the fact that in the past year, the most prolific in difficulties of any year since 1906, we have not been compelled to call even one council meeting. We have held two council committee meetings pursuant to a custom outlined by the council some years ago, whereby it is possible to delegate the powers of the council to a committee of three or more at the option of the president whenever he feels the nature of the matter to be considered requires more than the opinion and attention of the executive.

#### The Importance of This Year's Strikes

In this connection please note also that every one of the shops we have been called upon to defend this season has remained steadfast to its determination to run an open shop, and has respected to the letter the contract entered into with the association. Not a single shop of the entire number has surrendered to the union. I also wish to call attention to the fact that the efforts of the Iron Moulders' Union this year present a different aspect from that of any year since the association was formed, in that it has been backed to a greater extent by the American Federation of Labor than ever before.

In the Erie strike it was plainly evident at the start that the fight was to be one of the American Federation of Labor itself, that this organization proposed to unionize Erie, that it selected the Iron Moulders' Union, as the most powerful, both as to finances and fighting ability, to go to the front and bear the brunt of the strike. During the entire season representatives of the American Federation of Labor, outside of the Iron Moulders' Union, have been present in Erie, holding noon day meetings, so that the Erie people, instead of defending themselves against one individual craft, have maintained the protection and defense of the entire community. Too much cannot be said in praise of the action of the proprietors and their unanimity in all lines of trade in standing by each other and precluding an unionization of that city.

I believe the last year has proved more conclusively than ever before in our experience the point often made that to defend one's self against radical unionism, law and order must be maintained in the community. This point is well illustrated in numerous cases, especially in Erie and Cincinnati. The reports from these districts will show you that the union ceased its acts of violence whenever the municipal authorities asserted themselves properly. In Cincinnati, the city where the union has made many boasts of its ability to run things, soon after the mayor issued an edict that law and order should prevail at any hazard, the strikes in the shops of our members were called off unconditionally.

#### Report of the Commissioner

The report of A. E. McClintock, the commissioner, was in part as follows:

During the past year the association has been called upon to give its support in combating strikes to a greater number of members than at any time since the memorable conflict of 1906-7. Your officers have endeavored to meet promptly the issues presented, to give relief to the shops affected, and continue the defense to a successful conclusion. The support of the association in combating strikes has been accorded to 32 shops involving 1239 men. At the time of our last annual meeting, the association was combating strikes involving 11 shops, from which 349 molders and coremakers were on strike.

#### A Strike Because of Independent Molders

The first strike to receive the attention of your officers immediately at the close of our last annual meeting was at the shop of a member at Indianapolis. This foundry has for years operated on the open shop basis, and under normal conditions employed about 40 brass molders and core-makers, all of whom had been taken into the union with the exception of three men. The Molders' Union, through the Secretary of Local Union No. 56, sent to the management a written demand, from which the following is quoted: "I am requested to notify you that you will either have to run a union shop or a scab shop. If the three men that are not in the organization do not come into the union at the end of two weeks your shop will be struck."

The men in question did not "come in," and with the sanction of the national officers of the molders' union a strike was called, followed by the usual picketing and vio-

lent tactics. Now, bear in mind no question of wages, hours, or other issues were involved—simply the demand that three molders, employees of long standing, be discharged in order that the closed union shop might prevail. Later on this firm was obliged to go into court and seek an injunction to stop the lawlessness. A permanent injunction was granted and with it a judgment of \$6000 against the molders' union, for having entered into a conspiracy to force an illegal thing—the closed union shop.

#### The Present Attitude of the Unions

In reviewing the work of the past year and analyzing the causes of the various strikes, one is impressed with the fact that the thing uppermost in the minds of the union officials is the desire for the recognition of union authority, which they consider more vital than the question of wages, hours, or conditions of work. With recognition, which carries with it the union closed shop, the collection of union dues is made a simple matter, and the employment of the individual is made contingent on his keeping in good standing in the union. With recognition, the union officials are in a position to claim credit for every shop betterment, every increase in pay that is made.

It should be kept in mind that all the unions, comprising the American Federation of Labor (of which the molders' union is one), constantly and persistently fight efficiency, discipline and scientific management, in short, oppose every means of increasing output and reducing unit cost. Strange as it may seem, these unions stand for monopoly, violence and coercion and against personal independence. They hold that the non-union man has no right to life, liberty and the pursuit of a job. At a time when the world demands of capital the utmost commercial freedom, the widest competition, the greatest energy, and the cheapest and best service, labor unions stand for the exact opposite—for tyranny, combination in restraint of trade, higher cost, sloth and inefficiency.

To continue a foundry on the open or non-union shop basis, it is imperative that the management be constantly on the alert in preventing union agitators getting employment in their plants. It often happens that carelessness in engaging one or two strangers, whose previous records are unknown will, in a short time, be instrumental in causing a strike. Such a condition can be almost entirely eliminated by the management making the investigation of all applicants for employment and the general labor situation in the shop a part of the daily routine of the business.

#### Report of the Secretary

The report of Secretary J. M. Taylor was in part as follows:

Notwithstanding the general unsettled condition of business and the activities of the labor unions, the treasurer's report shows that the association is in excellent condition financially and it is likewise in splendid shape so far as its membership is concerned. The total membership as of this date is 536 plants.

#### The Review

There is no question that the Review is increasing its influence every day. In addition to the requests from the workmen, there has been considerable demand for it from colleges, Y. M. C. A.'s and other public institutions.

As reflecting the present day public sentiment, and the necessity for an extension of the work attempted by the Review, I will call your attention to some recent newspaper items and headlines.

The first is from the Chicago Tribune of November 5 in connection with an article reciting the arrest of Elmer L. Hitt, business agent of the Painters' district council, for an alleged assault upon a non-union workman:

The judge disposed of the case as follows, according to the stenographic report of the proceedings: "All my sympathies are with union labor, and I have no sympathy for non-union men. I believe a man has no right to work in this country unless he is a member of a labor union. Under the circumstances I cannot fairly judge the case and I transfer it to Chief Justice Olsen for reassignment." Judge Olsen sent the case back, and the prosecution declined to go on with the case in view of the startling statement of Judge Wade.

The convention of the American Federation of Labor was called to order by President Gompers, with Secretary of Labor Wilson sitting at his side. Mr. Wilson, who addressed the delegates as "fellow unionists," said: "The Department of Labor as now organized and directed will be utilized to co-operate with the great trade union movement in its effort to elevate the standard of human society. There can be no mediation, there can be no conciliation between employers and employees that does not presuppose collective bargaining, and there cannot be collective bargaining that does not presuppose trade unionism. . . . I wish to see created within the Department of Labor," he said, "a bureau that will gather information as to where men can find employment, the wages they receive, the hours of employment, whether a trade union is recognized, and last, but not least, whether any trade dispute exists."

It will condense that information into a sheet that can be posted in every postoffice in the United States and in every other place where men congregate."

On the same date there appeared an item to the effect that a company of militia used to prevent strike riots was unable to get its pay, due to the fact that the paymaster was a local Federation of Labor officer.

#### The Attitude of the General Public

I believe if you will make a little investigation of your own among the professional classes and others not directly concerned with the employment of labor, you will find that the great majority look on labor unions as organizations designed solely for social betterment—an humanitarian work, pure and simple. When you point out the evils of closed shop unionism, they invariably take the position that these are due to individual practices and are therefore not serious; that the union leaders will soon have their

organizations so perfected that these evils will be eliminated.

An argument quite commonly advanced is that we should no more condemn the closed shop unions because of the crimes committed by their members than we should the churches for the acts of some of their members. They do not realize that these evils are part and parcel of present day trade unionism; that they are due to the fundamental principles of the closed shop. Samuel Gompers, John Mitchell and other union leaders are to them the ideals of unselfishness, patriotism and good citizenship.

Both the outside public and the rank and file of the workmen want to be fair. They are honest in their opinions. But they are not furnished with the necessary information to enable them to arrive at an impartial decision; on the contrary their opinion of the employers' position is deduced entirely from union statements.

## Members Reports on Some of the Strikes of the Year

A most comprehensive report on strike troubles was made by Thomas E. Durban, Erie City Iron Works, Erie, Pa. He is president of the American Boiler Manufacturers' Association and was introduced by President Briggs as one of the most distinguished members of the National Founders' Association and almost a charter member. Mr. Durban explained that the strike had been called because Erie workmen were non-union, because the city was conspicuous in this respect, being an important manufacturing city not far from Buffalo, Cleveland and Pittsburgh and because Erie must be made a source of revenue to the American Federation of Labor. What gave Erie manufacturers courage to take up the fight he said was the fact that the Federation was behind the fight and that it was regarded better to die fighting than to bow to a slow death. The Erie manufacturers had formerly kept its hands off of matters of this kind, nurturing the belief that the persecution of manufacturers was on the wane, and Mr. Durban suggested that it was singular, to say the least, that civic betterment societies have nothing to do with important affairs of this kind.

#### Unions Turning Men Into Commodities

Mr. Durban's address was in a large degree a discussion of the effects of the closed shop and after relating how one Erie manufacturer on accepting the union had trouble within 30 days, spoke in part as follows:

Stripped of all sentimentality, it is a fact beyond dispute, that labor is a commodity and should only command in the market a fair price. That men themselves are not a commodity, everybody knows and agrees, but what they have to sell—their labor or their ability to produce—is as much of a commodity as anything else used in our processes of manufacture. Any movement that seeks to destroy the relations that exist between supply and demand for a commodity is uneconomical and in the end must fail. Legislation or concerted action can no more make 50 cents worth of labor worth a dollar than it can make 50 cents worth of silver worth a dollar. There must ultimately be value received in all commodities to make permanently successful business.

We know of no organized effort on the part of anybody but the unions to turn men into commodities. The levelling of all men into one class by combined bargaining, and doing away with ability, as is the attempt of trade unions, is the only concerted action that has ever been brought to the writer's attention, toward turning men into commodities. The entire effort of trade unions, and their sentimental sympathizers, is tended toward this. No manufacturer that I know of ever for a moment took this attitude toward his men. Turning a man into a commodity is solely the effort of trade unions and it aids them in their control of their men.

He quoted some figures from a bulletin issued by the

Labor Bureau to show how the strongest unions obtained the least increases in pay. Part of these figures are given in the table at the bottom of this column.

#### Labor Against Capital Not a True Contention

Another point on which the issue has been fought, he continued, is that labor is against capital, which is not true. It is labor against manufacturers, and the vast majority of manufacturers are not capitalists. I think it a fair statement to make that 75 per cent of manufacturers are borrowers. The office of a manufacturer is to take capital, build a plant, and employ labor. He has on one side the capital, and on the other side the labor. He combines them and makes a useful article. As the affair stands to-day, he has the labor unions pounding him on one side, the capitalists who have money in the plant in the shape of bonds or money loaned driving him on the other side, and the consumer to whom he sells, forcing him in another direction.

#### Brief History of the Erie Strike

In the early part of February, 1913, the strike in the various shops had reached such proportions that it was decided to hold a meeting of the manufacturers for the purpose of making a declaration. About 50 manufacturers attended the meeting, at which a declaration of principles was adopted. Only one or two firms dropped out in its support. The association as an organization individually has lived up rigidly to the letter of the declaration, and maintained its spirit throughout the entire experience.

To carry out the intents and purposes of the declaration, an executive committee, the membership of which is a secret, was appointed and so successfully has this committee worked and so well has its individual identity been shielded, that one of the labor leaders is reported to have said that he

had never seen such an unreasonable "bunch," inasmuch as he had been unable to find a single person with whom he might talk.

Arrangements were entered into with an institution of national breadth, whereby guards were employed—men to work "under cover" and on the streets to watch violence both in its outcropping and action. With this force of men, the executive committee was at all times advised as to the movements of the strikers both from within and from without.

To provide for the comfort of the workmen, a large building capable of housing fully 300, was leased. Inside of 10 days after the establishment of this building as a



WILLIAM H. BARR

The new president of the National Founders' Association. Mr. Barr was largely instrumental in establishing in 1900 the Lumen Bearing Company, Buffalo, of which he is treasurer and general manager. He is a member of the American Society of Mechanical Engineers, chairman of the alloys committee of the Society of Automobile Engineers, and president of the Employers' Association of Buffalo.

Decrease in number  
of hours per week, '12-'07, per cent. Increase in pay,  
'12-'07, per cent.

	Decrease in number of hours per week, '12-'07, per cent.	Increase in pay, '12-'07, per cent.
Boiler makers .....	1.6	15.6
Core makers .....	2.3	13.8
Machinists .....	2.2	9.6
Pattern makers, wood .....	2.8	8.3
Iron molders .....	1.3	7.4

housing, the onslaught upon it became so serious and the antipathy of the local police so noticeable toward the outsiders that the "under cover" men had to make arrests. The open antipathy of the city police, coupled with the limitations laid upon the special guards by the state law, rendered it absolutely essential if life, limb and property were to be properly and effectually guarded, that other means be provided. Happily, the commonwealth of Pennsylvania possesses a squadron of mounted police. An ample detail from this force was sent to Erie by the state authorities. Since the arrival of this detail there has been practically no trouble, barring minor and isolated instances of petty brawls.

After a short time it became known that men were wanted in Erie. The association's labor bureau was flooded with applications from all parts of the country. However, it is a fact worthy of note in this connection that none of the men employed were professional strike breakers nor bonus men. All railroad fares to Erie were paid for the men. They entered the employment of the various shops after signing a paper whereby they acknowledged their cognizance of the conditions under which they went to work, that their wages were specifically set forth and that they knew exactly the sort of work they individually were expected to perform. They were furnished board not to exceed \$5 per week, but this was not compulsory.

It had been agreed by the members of the association in the declaration of principles, that they would not confer with anyone but the employees, and under no circumstances would they confer with a "representative." In this policy the manufacturers have stood together as a unit, with the exception of one or two, and have promptly and cheerfully met every demand made upon them incident to the defense and resistance. The financial and moral support given the executive committee has been most cheerful

#### Personnel of Employers Committee Secret

At this point, it must be stated that one of the prime lessons of the strike is conveyed in the working of the secret committee, inasmuch as the committee was in no way hampered with miscellaneous suggestions as would have been the case had the strike operations been directed by the action of general meetings of the association. Furthermore, the determination of the committee pursuant to the resolution contained in the declaration of principles, to afford utmost and absolute protection to the workmen, resulted in the birth of a shop loyalty among the men under strike conditions, the like of which would not have been

## The Misrepresentation of Factory Conditions in the Public Press

Henry M. Leland, who was introduced as a charter member of the association, delivered an impassioned address, which was an elaboration of the remarks he made at the meeting of 1912. In no period as a nation, said he, has there been so wide a spirit of unrest and dissatisfaction as at present. Influences are abroad inflaming ignorance. There is a feeling prevalent that the masses are being robbed and that successful business is controlled by three heartless gods: gold, greed and gain.

#### The Strong Position of the United States

The population of the United States, he continued, is 5 per cent. of the population of the world. In 1908 it produced 13,000,000 500-lb. bales of cotton, or more than two-thirds of the total for the world of 19,000,000 bales. In 1909 it produced 2,772,000,000 bu. of corn, more than two-thirds of the world's supply and five times as much as all the continent of Europe. It produced more than one-third of the world's production of coal; nearly one-half of the world's production of iron; nearly one-half of the world's production of steel; over one-fifth of the world's production of gold and one-fourth of the world's production of silver. The total of deposits in savings banks in the United States is more than one-half of the savings deposits of the world, a significant fact when it is realized that these do not represent the holdings of those regarded as wealthy. In 1910 there was 250,000 miles of railroad track completed in the United States, the extent of which may be indicated by noting that it would take 173 days of continuous travel at a rate of one mile a minute to cover every mile once. He mentioned how farm property, in spite of the fact that orators weep over the hard lot of the farmer, had increased in value in the 20 yr. from 1890 from about \$20,000,000 to over \$40,000,000,000, or more than double.

Mr. Leland suggested he had presented enough figures to justify the contention that the wage earner in the United States is a prince compared with those in any other country.

and generally is impossible where such protection is not afforded.

Efforts to settle the strike were made by municipal, state and federal authorities. The city council passed resolutions looking toward action on their part that would tend to bring together the employers and the strikers. The firmness of the association in living up to the resolution not to meet anyone except the employees themselves obviated the possibility of settlement as the result of any councilmanic mediation. The association contended that it had nothing to arbitrate. They would not arbitrate the unionizing of the shops—that was the issue. One cannot arbitrate his business into the hands of some one else. A representative of the Department of Labor came to Erie from Washington. His visit, however, resulted in a published interview, the substance of which, it must be said, would do no great credit to the present national administration. In the early part of the strike several commercial organizations entered into correspondence with the association looking toward discovering some method of settlement. These efforts were met with the spirit and intent of the resolution in the declaration that the association would not confer with the representatives of any trade union.

## The Other Strikes Reported On

H. N. Covell, Lidgerwood Mfg. Company, Brooklyn, N. Y., told of a strike in the company's foundry in New Jersey. The core makers struck for equal wages with the molders. The strike was fought for the principle involved and not on account of the money. The history of the foundry had been that on moving it from Brooklyn the cost of castings had jumped up 30 per cent. Mr. Covell paid a tribute to the efficiency of the association that foundry operations continued without missing a beat and the result has been that young men have been taught molding and are succeeding so well that better work is now being turned out with less loss and at less cost than for any time in 25 years. Mr. Covell agreed that while he was always ardent toward the association, the word does not describe his attitude now.

For W. D. Tynes, Hardie-Tynes Mfg. Company, Birmingham, Ala., who was absent on account of a death in his family, E. H. Sholar, Chattanooga Implement & Mfg. Company, Chattanooga, reported briefly on the Birmingham labor troubles.

He referred to his visit to Germany this summer with the American Society of Mechanical Engineers. He talked with the wage earner and saw him in his home. Wages there, he said, are less than half what they are here for the same work.

#### The Publication of Unfair Exaggerations

He then offered as an example of the misconception and misrepresentation that is rampant a cartoon published in a recent periodical. This showed a lot of factory workers, mostly children, straggling along the road to the distant factories, listless, wan, ill-clothed, while in the haze at one side of the road rose three gigantic phantoms, Buddha-like, labeled Gold, Greed and Gain. Mr. Leland vehemently attacked such presentations as untrue and unjust. He suggested that the presentation of such calumnies make fair the charge that the advertisers in such publications are paying for the dynamite for their own destruction. He had never seen such a scene as depicted and he had been reared in a factory village in which the hours of work were from 5.30 in the morning to 7.30 in the evening, with three intervals of  $\frac{1}{2}$  hr. each for meals. He distributed photographs of factory workers, their surroundings and their social life in cotton mill towns in the South to disprove charges made particularly regarding child labor at least for certain sections. The views were supplied by a friend of Mr. Leland's who before his investigation claimed to a grievance against manufacturers. One of the problems which has to be met in connection with child labor is the perjuring parents who desire the income of the working child.

Mr. Leland emphasized that he would not endorse any special privilege for the benefit of the association that was not a right and a privilege for any other organization. The love of fair play, he asserted, has been the organization battle cry. It was greatly to the workingmen's credit, he continued, when one realizes what has been going on for

45 yr.; when he considers that with all the efforts the labor army does not number more than 1,800,000 out of 20,000,000 or more workingmen. The facts he regarded as a testimonial to the good sense, honesty and integrity of the American workingman, to which Congress is so dead that it is actually seized with labor pains.

Mr. Leland confessed to not being well pleased with the signs. There was too much to indicate the rule of the mob with all that this may mean and hoped that shortly we shall be able to return to reason directly. We are in an age of experiment and there is a constant cry to try new things. Events are happening that would be nothing short of startling a few years ago. Have we not gone too far toward a paternal form of government, he asked; has liberty been misconstrued as license? He recounted a case before a Senate committee to show that the committee did not want to know the facts. He asserted that the people do not know the other side of the case and that it is necessary to create public sentiment, as it is the pride of American citizenship that all stand equal before the law.

He was certain that the remedy was education and that money must be spent in that way. What the school inculcates, he said, the newspaper eradicates. He told of some of the ways he was carrying on the educational campaign, like distributing large numbers of copies of The Square Deal to workmen in Michigan, and advised distribution among workmen of reprints of an article printed in *The Iron Age* of February 20, 1913, on "The High Cost of Living," of which, he said, "Nothing is so convincing, so true as this."

In the discussion following Mr. Leland's address, W. M. Gartshore, McClary Mfg. Company, London, Ont., suggested the advisability of providing for frequent visits through factories by classes or sections of classes of high and other schools. This, he felt, would assist in educating the community with regard to the actual conditions in factories. E. H. Sholar, Chattanooga Implement & Mfg. Com-

pany, described briefly the system in vogue with the Chattanooga Manufacturers Association. Committees of superintendents arrange for visits to a given factory each week, and it is naturally the ambition of each superintendent to have conditions as good as possible, with resultant permanent salutary effect.

### The Union as a Lawless Body

The general attorney for the association, George F. Monaghan, addressed the meeting on "Union Lawlessness." He contended that the union as constituted today cannot continue without lawlessness. He referred to the action of the Supreme Court of the United States in the Debs case, which refused to consider it as a violation of the Sherman law, but held that it should be considered solely on the basis of common law, under which lawlessness is subject to court prohibition. He considered that in its constitutional recognition of the picket and of the closed shop the union put itself in the light of interfering with the execution of contracts. He admitted that the men have the right to organize to strike, but where the organization is constituted to encourage unlawful objects, it has become smirched with lawlessness.

He referred to the exemption which labor has obtained by the much talked of provision in the sundry civil appropriation act. He emphasized that there is quite a general misunderstanding in this connection, as the act stands as it was originally but with the effect that it does prevent prosecution of any such body as organized workmen for illegal practices, because of a lack of appropriation for such prosecution.

He emphasized that it is not generally understood how great an influence the head of the American Federation of Labor exercises in Congress, and recounted some experiences to bring out his point. He urged that employers should remember that every letter to a congressman cuts some figure, and this fact should not be forgotten.

## The Situation Regarding Pro-Labor Legislation

Marshall Cushing, as Washington correspondent, submitted a report on legislation in part as follows:

The past year has been a comparatively quiet one at Washington in matters of legislation relating to employers, but plenty of it of the most radical and dangerous kind has been accomplished and more is contemplated with the kind of determination which, the requisite opposition lacking, bids fair to be successful.

Anti-injunction legislation or any attempt at it deserves to be watched closely by all manufacturers; so also the work of the new Industrial Commission; so also the proposition to amend the Sherman law. Each one of these devices by which organized labor continually seeks to secure class favor might by itself alone well claim the close attention of all interested persons who believe in doing what they can, no matter how inconspicuously. Taken altogether these propositions are most threatening to contemplate the effects of.

### Inefficiency by Force of Politics

A doubly interesting phenomenon of the past year has been the effort of the Ordnance Bureau of the Army to introduce efficiency methods into the Government arsenals, or into two of them, quietly. The Ordnance officers conceived the rather novel idea that though the Government was really the employer of the workmen in these Government shops, it would nevertheless be the fair thing for the workmen to give value, or a fair proportion of it, for the wages that they received. So they began a series of time studies, just as it was inevitable that they should do if they desired to develop a greater efficiency on the part of some of the men (and later, possibly, on the part of all of them), by first knowing who the less efficient were. But the arsenals, like the navy yards, are in politics all the time, and usually the protests of the organized workmen in these branches of the Government service are strong enough to intimidate any properly accredited Senator or Representative.

This effort to improve the efficiency of Government workmen, though attracting little notice, is startling in its political consequences, and that is why it is a doubly interesting phenomenon. If Government employees must

not be efficient, then they may be less and less efficient, and in time nobody on the Government pay-roll would need be efficient at all, and the taxpayer would have his trouble for his pains if he undertook to make objection. The effort, too, is very instructive because of the fact that a prominent cabinet officer tells the manufacturer that all that he needs to do to meet competition from any part of the world is to be efficient throughout his manufacturing and marketing organization, and thus, with union labor opposed to efficiency and a benevolent Government afraid or powerless to insist upon it, a truly difficult dilemma appears; but the manufacturer, and not the Government at all, is to suffer for it, because he and no one else is the one who must introduce efficiency methods which the unions and their political representatives will not have.

### Employers Must Lead the Way

It may truthfully be said, and surely it ought to be said, that evils for which capital is responsible exist in the present industrial situation, just as they have existed in previous situations and have gradually been eliminated from them. There is no help for capital against the demand that these proper subjects for attack should be minimized; indeed, it may confidently be said, and surely it ought to be said, that if capital, or the employers, or the property owners and business men, and the good citizenship of the country generally, were themselves to be the first to insist upon such a program of real reform, the reform itself would come the quicker because reason would be used to effectuate it and with it the sincerity of intelligent and honest men who saw their faults and proposed to correct them of their own accord.

I do not believe that there is a member of this organization, and I have never personally known a manufacturer, who has unwittingly exposed his business, or himself as its trustee, or good business and progress generally, to the danger arising from the practice of injustice or arrogance in his own works. But even as the damage resulting from each agitation and from the composite of agitations from which the country is suffering, and from a Government by one

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# THE IRON AGE

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## The Disqualified Business Man

As national and State legislation now has to do so largely with economic questions, it is not an encouraging sign that intimate knowledge of the intricate matters dealt with by Congress and legislatures is at such a discount. Indeed knowledge is coming to be a *prima facie* disqualification. The refusal of the makers of the new currency bill to consider bankers as fit men to give advice concerning its provisions, or to be members of the proposed Federal board of control, while a glaring example of the present tendency, is only in line with much that has come along with the economic revolution through which the country is passing.

Nothing more strongly impressed itself upon manufacturers called to Washington in the past two years in connection with the Congressional investigations of tariff, finance, and the trusts than the ignorance their questioners showed of the matters under investigation. Machine tool manufacturers who went to the capital to protest against putting their products on the free list found that the committeemen responsible for this provision in the original Underwood bill thought that thereby they were freeing the machinist's kit of tools from an onerous duty! It was not a case of differing opinion as to what constitutes a machine tool, such as developed in connection with the decisions of customs officers, but of not having a remote idea of the real meaning of the term as covering the products of a great business.

Some questions asked of steel manufacturers at the tariff hearings and the Stanley committee sessions, as to ordinary facts relating to the sale of their products, showed amazing ignorance of the way business is done. But as there has developed in all parts of the country in recent years much dissatisfaction with many business methods that have been long in vogue the possession of what is commonly known as business ability, by a candidate for Congress, has naturally not been regarded as indispensable.

Recently the proposal has come up of an appropriation of several hundred thousand dollars for a "scientific" investigation of big business by the Bureau of Corporations, and it is the natural presumption that eligibility to the ranks of the investigators will depend not at all on experience with business of any size; probably more on a desire to find ground for the charge that large corporations have proved inefficient successors to their smaller components.

Another phase of the suspicion under which all business has fallen at Washington is indicated by the proposal to investigate a steel company which was reported to have suspended shipments on one of its raw materials because its customers had considerably reduced their specifications, so that mills could no longer be run to full capacity. The President and the Secretary of Commerce were asked to investigate the action of the company in question, evidently on the theory that all business virtue and all business competency now have their rise in government sources. It never occurred to manufacturers in the régime now so rapidly passing to ask permission at Washington when it became necessary to adjust output to demand; but that was before the days of government by accusation, investigation and inspiration. They should not be harshly judged if they require some time for adjustment to the new conditions. At the same time, in view of the apparent readiness in high quarters to throw discredit upon their ability and patriotism, our

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manufacturers need not be entirely surprised at the announcement that "special agents of the administration have been employed for weeks, secretly so far as possible, watching every detail of the industrial situation." All this, we are told in Washington dispatches, is in preparation for quick action "should the administration be convinced of an effort by any interests to manipulate an industrial flurry."

The "quick action" threatened may be none other than the hasty erection of the gibbet awaiting the manufacturer whose output declines while the well-heralded readjustment to lower prices is under way. We can at least hope there will be no quick action of any sort; that instead we may have a sober second thought, and perhaps eventually a resort to the "rule of reason" in the administration's handling of industrial affairs. Nothing would do more to shorten the period of hesitation upon which business has entered than one positive indication of a change in the attitude of Congress and the executive arm of the government toward manufacturers, bankers, railroad heads—all the leaders in enterprises whose prosperity or depression means prosperity or depression for the country. Zeal in the cause of making it hard to carry on business may be overdone. So also may legislation on business "without the aid or consent" of business men.

### The Economies of Careful Planning

A house which manufactures small machines in large numbers has for several years maintained complete records of all its managerial conferences and meetings having to do with details of policy, including those pertaining to improvements in methods of production and in the design of the product. Each discussion is taken stenographically and is filed in the archives, either in full or in abstract, after being copiously indexed for easy reference. The practical value of the system has been demonstrated repeatedly, and much duplication of effort has been avoided. It sometimes happens that ideas which are given enthusiastic indorsement at such a meeting have been thrown aside quickly, because the records have shown they were not new, but previously had been investigated and found impracticable, possibly in another form, but at any rate in a way to discredit them for the purpose at issue. The system has thus accomplished the dual saving of money for investigation and of money lost in wasted time in bringing out a supposedly improved product.

In many plants where machinery is built, systematized planning is not carried far enough. Errors are not discovered until money has been sunk. Such a waste is in many cases unnecessary. The ounce of prevention which comes from deliberate, analytical study of the problems involved has not been developed, and the result is the expenditure of the pound of cure which sometimes may be translated into thousands of dollars. A bit of carelessness in planning may mean changes all along the line of the design, even to a discarding of the model for one essentially different in many of its details. A system of record of all previously acquired knowledge would often eliminate such a waste of time, money and energy.

In the factory in question an improved machine was to be brought out, to meet certain conditions, and a year was given the works manager in which to pro-

duce it, ready to meet the demand of the market. Several months were spent in planning before a piece of material was touched by a tool, even for the jigs and fixtures. The various new problems were studied in great detail. The records were carefully examined and much valuable information was obtained, not only concerning what to do, but what should not be done. Every detail was planned, in relation to its own functions and design, and in relation to the machine as a whole. Exact knowledge was obtained up to the limit of the possibilities available. The result has been a machine as nearly perfect as is believed possible by its builders, produced within the time limit and at a minimum of cost through all of its stages of design and manufacture.

### Capacity and Movement of Freight Cars

The campaign which is now well under way for the heavier loading of freight cars makes of interest the statistics in the belated report of the Interstate Commerce Commission, just issued, for the fiscal year 1911. A complete statement is made as to the freight cars of the country, which are divided as to style, whether box, flat, stock, coal, tank, etc., and also as to capacity, each class representing a multiple of 10,000 pounds. Class 1 includes cars of 10,000 pounds capacity or more, but under 20,000 pounds; class 2 those of 20,000 pounds or over, but under 30,000 pounds, and so on. Some classes were vacant, there being none of 160,000 or 170,000 pounds capacity, for instance. There were four cars of 180,000 pounds capacity, but under 190,000 pounds, and there were none larger, except a solitary car which had a capacity of 142 tons or 284,000 pounds and thus falls in class 28. The report is more than two years old, and this car now has considerable company. The number of cars of each capacity, as of June 30, 1911, is shown below:

Class number	Capacity, pounds.	Number of cars.
1.....	10,000	1,643
2.....	20,000	5,170
3.....	30,000	4,548
4.....	40,000	87,920
5.....	50,000	105,666
6.....	60,000	823,856
7.....	70,000	39,663
8.....	80,000	614,788
9.....	90,000	6,688
10.....	100,000	475,871
11.....	110,000	29,059
12.....	120,000	158
14.....	140,000	286
15.....	150,000	10
18.....	180,000	4
28.....	280,000	1
Total cars.....		2,195,331

Aggregate capacity, tons, 81,077,028; average capacity, tons, 37.

Thus there are two great groups; cars having 40,000 pounds capacity and over, but under 70,000 pounds, there being 1,017,442 in this group, and cars having 80,000 pounds or more capacity, but under 110,000 pounds, there being 1,097,347 in this group. Of the total number of cars, those in the first named group comprise 45.6 per cent., while those in the second group comprise 50.2 per cent. Roughly speaking, the cars in the former group are largely box and flat cars, while those in the latter group are largely coal cars.

It is to be noted, however, that there are many box cars in the 80,000-pound class, with none in the 90,000-pound class and one-fourth as many in the 100,000-pound class as in the 80,000-pound class.

The movement for heavier loading of cars is largely a movement to correct a one-sided development. The railroads have been buying larger cars and abandoning their smaller cars, but there has not been a corresponding increase in the loading. In the transitional period from small to large cars the average shipper frequently does not know what capacity of empty car is going to be furnished him and in such a case he is often unable to fill a large car if such happens to be furnished. Only to an extent can he select the capacity of car he desires and be assured of getting such a car. As the old and small cars are disappearing rapidly the uncertainties are decreasing, and heavier loading can be urged with propriety.

For the fiscal year 1911 the revenue freight ton mileage is given at 253,783,701,839. The freight car mileage, loaded, in revenue service, is given at 12,666,136,106, so that it can be readily computed the average load was 20 tons, which compares with an average capacity of 37 tons. This would show an average underloading of 46 per cent., but the situation is much worse than that, for in the case of coal and ore in particular, and in other commodities in minor instances, the shipper usually takes advantage not simply of the full rated capacity, but of the 10 per cent. overload permitted. Were it possible to separate this business from the aggregate of the returns as given in the Interstate Commerce Commission's reports, it would undoubtedly be shown that in all other traffic the average loading is well below 50 per cent. of the marked capacity of the car.

The freight car mileage in revenue service was 12,666,136,106 car miles loaded and 5,718,739,249 car miles empty, a total of 18,384,875,355 car miles, the proportions being 69 per cent. loaded and 31 per cent. empty. Dividing the total car mileage by the product of the number of cars and the number of days in the year gives 23 miles as the average daily journey of a car, of which about 16 miles is loaded and 7 miles empty.

Here are presented two equally promising fields for increasing the economy of railroad operation, increasing the car loading and increasing the car movement. In both cases the shippers can co-operate, for shippers do frequently keep cars an unnecessary length of time, thus reducing their average travel. As to the car movement, however, the greater burden is upon the railroads. The layman cannot be convinced that cars cannot be moved much faster than they are.

**The First Vessel Through Panama Canal.**—With many prominent canal officials and their wives on board, the small steamer Louise on November 17 had the honor of being the first boat to pass entirely across the Isthmus of Panama through the Panama Canal. The trip was made possible by the dredging of a channel through the Cucuracha slide, the last obstruction which has delayed the work on connecting the oceans. The dredges will complete the work of widening the channel at this point, and a Panama dispatch states that in case of necessity a large ship could be sent from ocean to ocean on short notice.

The Downingtown Iron Company, Downingtown, Pa., manufacturer of boilers, stacks, etc., has just celebrated the first anniversary of its establishment. It reports having had a prosperous year, and now has enough orders booked to keep its plant in operation for some considerable time.

## Correspondence

### The Panama-Pacific Exposition

*To the Editor:* The editorial appearing in *The Iron Age* of October 16, entitled "Manufacturers and the Panama-Pacific Fair," is exciting considerable interest on the Pacific coast, and as suggested by you the subject is being investigated by our civic bodies so that a plain direct statement may be made covering the points that you have raised regarding the employment of union labor in setting up and operating machinery that may be placed on exhibition by Eastern manufacturers. I have this morning learned from official sources that the Panama-Pacific Exposition has a distinct understanding with labor organizations in San Francisco that every member of the union will willingly work with any man or men sent out from the East. The mechanic sent out with the machinery, either to operate or install it, will not be required to join any local union or work under its rules. I am also informed that the Exposition Company has notified the National Association of Manufacturers to this effect.

However, my main object in writing you at this time is to call your attention to a very common misapprehension of facts. You say that "the Exposition project is close to the hearts of Californians." Very true, but we Californians would indeed be disappointed if it was not equally dear to the hearts of every citizen in every State and Territory. This is not a California exposition. It is a national, if not an international one, to be participated in by most of the civilized countries of the world, and it would be regretted if the impression should get abroad that it is purely a local fair. Certainly a canal which brings the Atlantic and Pacific coasts 10,000 miles nearer each other is not a local affair. The advantages to be gained by the Atlantic coast will far exceed those of the Pacific, and it seems to me that this is a point that should be brought out prominently.

A. C. RULOFSON,

President Home Industry League of California.  
SAN FRANCISCO, CAL., November 17, 1913.

### The Right Use of a Trade Journal

A Striking Illustration of Economies  
Open to Readers of "*The Iron Age*"

BY W. D. FORBES, M. E.

A certain manufacturing concern was in financial difficulties and its creditors, instead of placing it in the law, wisely determined to run it themselves. I was employed to look over the plant, inventory it and give a general report. In the storeroom I found a box that had never been opened and that contained a fine pair of steam indicators. I found that they had been sent with the engines which had been installed eight years previous. I had observed that the boilers seemed large for the work that was apparently done and that at noon time the two engines were not shut down but were kept just turning over. Having an hour or two to spare one day, I took out the indicators and rigged them up on the engines, as the piping was all ready and the indicator motion also fitted. The cards I took from the engines were too bad to think about. The following day I reset the valves and I was able to cut off two of the battery of five boilers and still have ample steam. The reason why the engines had not been stopped at noon, the engine driver said, was because they started so hard.

Now it must be remembered that there had been eight years of this condition, and in figuring it out I found that the cost of the two extra boilers, the water and coal consumed by them, and the extra land that had to be bought to place the boilers, amounted to a tidy sum. It is not to be wondered at, with such a condition in one part of the establishment, that it met financial disaster.

Is it not a fact that there are hundreds of readers of *The Iron Age* who are closely following the lead of the

company referred to above? Certainly a trade journal is an indicator. It indicates what is taking place in the great engine of commercial life, and those who buy it often forget this.

Let me illustrate what I mean by an actual occurrence. Standing with the president of a company in his storeroom, a lot of forgings were dumped on the floor by the cartman. The receiving clerk brought the bill to the president, drawing his attention to the fact that these forgings had been charged at an advance of 40 cents each over previous prices. The president said that was all right, as it had been agreed to pay an advanced price in order to hurry the work.

When I returned to the office with the president I said to him, "I'll wager you a dinner that you can get those forgings from the people who advertise in *The Iron Age* at not much over half the price you are paying for them." The president didn't think he could. He had tried several places, and \$2.80 was the best he could do when getting the forgings made in two or three dozen quantities. We finally wrote to an advertiser and ten days afterward I met my friend at the club and he said: "You win; I'm perfectly astonished. I got those forgings in quicker time than I could have them made locally, they were better made, and they were delivered by freight at 80 cents each instead of \$2.80."

My friend had had, so to speak, an indicator locked up in *The Iron Age* for over ten years, and he has been figuring ever since how much money he lost in not using the information which had been before him all that time.

This case is not a single one; I could mention many others. For a number of years I sold certain articles which the users ordered of me at a very handsome profit, and which I had manufactured by a third party within five blocks of the concern that gave me the order; and I have to cry, "Peccavi," as, requiring two large herringbone gears, I contracted with a firm 260 miles from my works to cut them and later I found that this firm had sent them from their works to one within 16 miles of me, had them cut, paid the freight back, and reshipped them.

A trade journal is full of information of which very many of its readers fail to take advantage. Many complain to me that there are so many trade journals they cannot read them all and that the same advertisers are in all of them. This, of course, is not so; but were it so, it would pay better to take one journal and use it rather than take a lot of them and neglect to profit by the information they contain. Perhaps it is that many people feel it is somewhat of a disgrace not to be able to do a job as cheaply as anyone else can, and this may account for people staring at an advertisement and seemingly thinking that it is of no value to them personally but may be to somebody else.

A trade journal must rely on its advertisers for the income that makes possible the kind of service it gives its readers. There are advertisers who tell you that they continue to advertise but that it really does not pay them. Such an assertion shows they are very poor business men or else are not telling the truth. If it does not pay a person to advertise in any journal, that journal does not want his advertisement.

**Steel Foundry Operations at Chester, Pa.**—The six steel foundries at Chester, Pa., are operating on the average about five days per week, but on these days not at normal capacity. Some of the foundries which usually operate two furnaces are running only one. Three of the plants are turning out considerable work for the navy, one having the contract for all the castings for the new super-dreadnought, the Pennsylvania, being built by the Newport News Shipbuilding & Dry Dock Company, Newport News, Va., and others producing castings on various Government contracts for battleships and ordnance work. More castings for naval purposes, both Government and merchant, are produced in Chester, Pa., than in any other district in the country. Railroad demand is very light, which is the principal cause for the reduced output.

## Plan for Milliken Brothers, Inc., Reorganization

The bondholders' reorganization committee of Milliken Brothers, Inc., has declared its plan operative and has called for the payment of 15 per cent. on \$3,000,000 first mortgage bonds. The sale of the property under bankruptcy proceedings has been set for December 2, when the bondholders' committee will bid for the property. The new company, which will result if the reorganization plan is successful, will acquire under the plan the entire physical assets of the old company consisting of about 160 acres of real estate, principally on Staten Island, at Milliken, on which there are a steel fabricating plant and a structural steel rolling mill, including open-hearth furnaces.

The appraisers for the referee in bankruptcy estimate the value of the entire plant at \$2,478,880.08, which includes the dismantling value of the steel plant at \$691,850 and the working value of the fabricating plant at \$507,257.86. The steel mill, which was built in 1907, is stated to have cost upward of \$4,300,000, and to the fact that it exceeded its original estimated cost was ascribed the impairment of the company's working capital which resulted in the receivership in 1907.

Under the plan of reorganization, if it is accepted by all, the company will be provided with about \$750,000 of net current assets and be free and clear of all mortgages and other indebtedness except that it will issue 10-year debenture notes in return for the payment of the above-mentioned assessment. It is planned to operate the fabricating plant on the basis of 100,000 tons annual output. The operation of the steel mill is not contemplated at present, as working capital has not been provided for that purpose. The plan provides that the company shall have \$3,000,000 of preferred stock and about \$1,500,000 of common stock issued through the first mortgage bondholders.

## British Imports of Finished Steel Are Growing

British iron and steel exports for the first 10 months of this year show an increase in tonnage and value as compared with the same period in 1912. The total sent abroad to November 1, 1913, excluding iron ore and including scrap, was 4,247,812 gross tons, as against 4,119,616 tons to November 1, 1912, an increase of 128,196 tons. The increase in value is £7,122,785, the total exports to November 1, 1913, being valued at £45,972,382 as compared with £38,849,597 to November 1, 1912. Pig-iron exports still show a decrease, the total, including ferromanganese, being 950,447 tons to November 1, 1913, as against 1,092,894 tons for the same period in 1912. The exports of galvanized sheets were 106,868 tons greater to November 1, 1913, than for the first 10 months of 1912, totaling 631,084 tons.

Iron and steel imports, excluding iron ore and including scrap, for the first 10 months of 1913 show an increase of 250,494 gross tons, totaling 1,923,489 tons to November 1, 1913, as compared with 1,672,995 tons for the same period in 1912. The values for these two periods are respectively £12,896,255 and £10,639,226.

Commenting on these figures, the London Iron and Coal Trades Review says that imports of iron and steel to November 1, 1913, were some 200,000 tons above those of 1912, and not far short of 400,000 tons above those of 1911, and that conditions are indeed rapidly changing; that whereas semi-finished steel formerly made up the greater bulk of the imports, finished material is more and more taking its place. Imports of blooms, billets and sheet bars for the first 10 months of this year amount to about 660,000 tons against 700,000 tons in the corresponding period last year. The imports of plates, to November 1, this year, have increased 50,000 tons, and of angles and shapes, excluding joists, 45,000 tons.

**Foundrymen's Convention Preliminaries.**—Representatives of the American Foundrymen's Association, the American Institute of Metals, the Associated Foundry Foremen and the Foundry & Machine Exhibition Company will meet the local committee at Chicago, January 17, for the purpose of completing arrangements for the entertainment features for the foundrymen's conventions to be held in Chicago, September 7 to 12 inclusive, 1914. The entertainment features are to be without expense to local foundry interests.

# The Iron and Metal Markets

## Prices Slowly Receding

### Further Decrease in Production

#### Lower Price for Basic Pig Iron—Reduction in Bars for Pacific Coast

Briefly, the situation in the steel trade is that the mills are running at about two-thirds of capacity while new orders are coming in at a rate less than one-third of capacity. Producers are not so much concerned about the gap between new business and output, since that represents largely uncertainty as to prices. But there is uneasiness over the disparity between capacity and present consumption, counting consumption, in view of the scantiness of stocks in recent months, as virtually the same as output.

It is a long time since steel companies have lengthened a single holiday into three, as will be done by many of them this week. The policy at most plants has been not to throw men into complete idleness, but rather to reduce the number of turns and to operate four or five days in the week. Some smaller companies have had alternate weeks of full operation and shutdown.

Foundries have felt more the contraction in business in the past two weeks. The malleable foundries in many cases are near the end of their orders and machinery founders are feeling the falling off in the machine tool business.

The recession in prices of steel products is slow, contrasting with the rapidity with which business has dropped off. The low level of two years ago is not expected, in any event, until the country is ready for buying on a like scale.

Meanwhile buyers and sellers are finding meeting ground when new business comes up, at prices from \$3 to \$5 a ton less than the contract basis before the decline began. Thus, structural shapes have sold at 1.25c., Pittsburgh, plates at 1.20c. to 1.25c. and bars at 1.25c. to 1.30c.

New York Subway contracts calling for 27,000 tons of steel were let in the past week. At Pittsburgh the Fort Pitt Bridge Works was low bidder on the Bloomfield bridge, which will require 3500 tons. Plate mills will find some business in the large amount of repair work due to the lake storms, and several new vessels may be ordered to replace those lost.

There has been a weakening in wire products and some increase in bookings. Sales are reported at \$1.55 for wire nails and \$1.35 for fence wire, while in Ohio river territory as low as \$1.50 and \$1.30 respectively has been done.

Wrought pipe mills have an inquiry for 40 miles of 12-in. pipe for a Texas natural gas line and about 20 miles of smaller sizes.

Sheet mills have done more business at the prices brought out by recent sharp competition. While 1.95c., Pittsburgh, for No. 28 black has been considered low point, a large sale is reported at 1.90c., and galvanized has sold at 2.90c. The tin plate trade has developed several considerable inquiries and the Standard Oil Company, following its recent purchase of 200,000 boxes of Welsh tin plates, is negotiating further with makers both in Wales and at home.

The competition of German and Belgian steel bars on the Pacific Coast has forced further reductions from the special Pittsburgh prices named for that territory, sales being reported which figure back close to 1.05c., Pittsburgh. Plates and shapes are practically on the same basis at San Francisco.

More interest is shown in contracts for semi-fin-

ished steel as prices settle to the \$20 basis. A Cleveland inquiry for 4000 to 5000 tons of billets, for delivery in the first few months of 1914, brought out that quotation, while the buyer's offer is \$20, delivered, or \$18.50 Pittsburgh.

The foundry pig iron market is subject to the opposite influences of a slackening in foundry work and the blowing out of several furnaces in the Central West. Southern furnaces have slightly increased their output of foundry iron, and some of them have yet to deliver considerable iron sold at nearly \$1 a ton below to-day's market. Re-sale iron has been offered in the past week at \$10.50, Birmingham, for No. 2, while most furnaces are asking \$11. Chicago reports increased inquiry and quotations by local furnaces indicating more keenness for orders.

Basic iron in the Central Western Valleys has gone below \$13, a sale of 1500 tons, December delivery, having been made at \$12.85 at furnace. The inquiry by the same buyer for first quarter of 1914 is withdrawn for the present. Another inquiry is for 2400 tons for Maryland delivery and St. Louis interests are in the market for 6000 tons.

Philadelphia reports sales of 300 tons of English low phosphorus iron at about \$21.50, delivered in eastern Pennsylvania, with \$1 freight from Philadelphia. Domestic sales have been made at \$22 at Philadelphia.

## A Comparison of Prices

### Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous.

Nov. 26, Nov. 19, Oct. 29, Nov. 27,

Pig Iron, Per Gross Ton:	1913.	1913.	1913.	1912.
Foundry No. 2 X, Philadelphia.	\$15.50	\$15.50	\$15.75	\$18.50
Foundry No. 2, Valley furnace.	13.50	13.50	13.75	17.00
Foundry No. 2 S'th'n, Cin'ti...	13.75	13.75	14.25	17.25
Foundry No. 2, Birmingham, Ala.	10.50	10.50	11.00	14.00
Foundry No. 2, furnace, Chicago*	14.75	14.75	15.00	18.00
Basic, delivered, eastern Pa....	15.00	15.00	15.25	18.25
Basic, Valley furnace .....	12.85	13.00	13.75	16.50
Bessemer, Pittsburgh .....	15.90	15.90	16.40	18.15
Malleable Bessemer, Chicago*..	14.75	14.75	15.00	18.00
Gray forge, Pittsburgh .....	14.25	14.25	14.30	17.15
Lake Superior charcoal, Chicago	15.25	15.25	15.25	18.75

### Billets, etc., Per Gross Ton:

Bessemer billets, Pittsburgh...	20.50	20.50	22.50	27.00
Open-hearth billets, Pittsburgh.	20.50	20.50	22.50	27.00
Open-hearth sheet bars, P'gh..	21.00	21.00	23.00	28.00
Forging billets, Pittsburgh....	26.00	26.00	26.00	34.00
Open-hearth billets, Philadelphia	22.90	22.90	24.00	32.00
Wire rods, Pittsburgh.....	25.50	26.00	26.50	30.00

### Old Material, Per Gross Ton:

Iron rails, Chicago .....	13.50	13.50	13.50	18.00
Iron rails, Philadelphia .....	17.00	17.00	17.50	19.00
Carwheels, Chicago .....	12.00	12.00	12.00	17.00
Carwheels, Philadelphia .....	12.00	12.00	12.25	15.00
Heavy steel scrap, Pittsburgh..	11.25	11.50	11.50	14.75
Heavy steel scrap, Philadelphia	10.00	10.00	11.00	15.50
Heavy steel scrap, Chicago....	9.50	9.50	10.00	13.00
No. 1 foundry cast, Pittsburgh..	12.00	12.00	12.00	14.50
No. 1 foundry cast, Philadelphia	12.50	12.50	13.50	14.75
No. 1 f'dry cast, Ch'go (net ton)	10.00	10.00	10.25	13.00

### Finished Iron and Steel,

Per Pound to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Bessemer rails, heavy, at mill...	1.25	1.25	1.25	1.25
Iron bars, Philadelphia .....	1.27½	1.27½	1.32½	1.67½
Iron bars, Pittsburgh .....	1.40	1.40	1.50	1.65
Iron bars, Chicago .....	1.15	1.15	1.15	1.55
Steel bars, Pittsburgh .....	1.25	1.30	1.35	1.60
Steel bars, New York .....	1.41	1.46	1.51	1.76
Tank plates, Pittsburgh .....	1.25	1.25	1.30	1.70
Tank plates, New York .....	1.41	1.41	1.46	1.86
Beams, channels & angles, P'gh..	1.25	1.30	1.30	1.75
Beams, channels & angles, N. Y.	1.41	1.46	1.46	1.91
Skelp, grooved steel, Pittsburgh	1.25	1.25	1.30	1.45
Skeln, sheared steel, Pittsburgh ..	1.35	1.35	1.35	1.50
Steel hoops, Pittsburgh .....	1.45	1.45	1.50	1.50

### Sheets, Nails and Wire,

Per Pound to Large Buyers:	Sheets, black, No. 28, Pittsburgh	1.95	1.95	2.00	2.25
Galvanized sheets, No. 28, P'gh.	2.95	2.95	3.00	3.40	
Wire nails, Pittsburgh .....	1.55	1.60	1.60	1.70	
Cut nails, f.o.b., Eastern mills...	1.65	1.65	1.65	1.75	
Cut nails, Pittsburgh .....	1.55	1.55	1.55	1.70	
Fence wire, ann'l'd. 0 to 9, P'gh.	1.35	1.40	1.40	1.50	
Barb wire, galv., Pittsburgh....	1.95	2.00	2.00	2.10	

\*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

## Coke, Connellsville,

	Nov. 26	Nov. 19	Oct. 29	Nov. 27
Per Net Ton at Oven:	1913.	1913.	1913.	1912.
Furnace coke, prompt shipment..	\$1.75	\$1.80	\$2.00	\$3.90
Furnace coke, future delivery..	1.90	2.00	2.10	3.25
Foundry coke, prompt shipment..	2.50	2.60	2.75	4.25
Foundry coke, future delivery..	2.75	2.75	3.00	3.75

## Metals,

Per Pound to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York.....	15.50	16.00	16.87 1/2	17.75
Electrolytic copper, New York..	14.75	15.25	16.62 1/2	17.62 1/2
Spelter, St. Louis .....	5.10	5.15	5.30	7.35
Spelter, New York .....	5.25	5.30	5.45	7.50
Lead, St. Louis .....	4.15	4.20	4.20	4.35
Lead, New York.....	4.30	4.35	4.35	4.50
Tin, New York .....	39.50	40.15	40.10	49.55
Antimony, Hallett's, New York.	7.12 1/2	7.25	7.25	9.75
Tin plate, 100-lb. box, Pittsburgh	\$3.40	\$3.40	\$3.50	\$3.60

## Finished Iron and Steel f. o. b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Louis, 22 1/2c.; Kansas City, 42 1/2c.; Omaha, 42 1/2c.; St. Paul, 32c.; Denver, 84 1/2c.; New Orleans, 30c.; Birmingham, Ala., 45c.; Pacific coast, 80c. on plates, structural shapes and sheets No. 11 and heavier, 85c. on sheets Nos. 12 to 16; 95c. on sheets No. 16 and lighter; 65c. on wrought pipe and boiler tubes.

**Plates.**—Tank plates, 1/4 in. thick, 6 1/4 in. up to 100 in. wide, 1.25c., base, net cash, 30 days. Following are stipulations prescribed by manufacturers with extras:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, 1/4 in. and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per sq. ft., are considered 1/4 in. plates. Plates over 72 in. wide must be ordered 1/4 in. thick on edge, or not less than 11 lb. per sq. ft., to take base price. Plates over 72 in. wide ordered less than 11 lb. per sq. ft. down to the weight of 3-16 in. take the price of 3-16 in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

## Extras.

	Cents per lb.
Gauges under 1/4 in. to and including 3-16 in.	.10
Gauges under 3-16 in. to and including No. 8	.15
Gauges under No. 8 to and including No. 9	.25
Gauges under No. 9 to and including No. 10	.30
Gauges under No. 10 to and including No. 12	.40
Sketches (including straight taper plates) 3 ft. and over	.10
Complete circles 3 ft. in diameter and over	.20
Boiler and flange steel	.10
"A. B. M. A." and ordinary firebox steel	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Widths over 100 in. up to 110 in., inclusive	.05
Widths over 110 in. up to 115 in., inclusive	.10
Widths over 115 in. up to 120 in., inclusive	.15
Widths over 120 in. up to 125 in., inclusive	.25
Widths over 125 in. up to 130 in., inclusive	.30
Widths over 130 in.	1.00
Cutting to lengths, under 3 ft., to 2 ft., inclusive	.25
Cutting to lengths, under 2 ft., to 1 ft., inclusive	.50
Cutting to lengths, under 1 ft.	1.55
No charge for cutting rectangular plates to lengths 3 ft. and over.	

**Structural Material.**—I-beams, 3 to 15 in.; channels, 3 to 15 in.; angles, 3 to 6 in. on one or both legs, 1/4 in. thick and over, and zees, 3 in. and over, 1.25c. to 1.30c. Extras on other shapes and sizes are as follows:

	Cents per lb.
I-beams over 15 in.	.10
H-beams over 18 in.	.10
Angles over 6 in. on one or both legs	.10
Angles, 3 in. on one or both legs, less than 1/4 in. thick, as per steel bar-card, Sept. 1, 1909.	.70
Tees, structural sizes (except elevator, hand rail, car-truck, and conductor rail)	.05
Channels and tees, under 3 in. wide, as per steel bar card, Sept. 1, 1909	.20 to .80
Deck beams and bulb angles	.30
Hand rail tees	.75
Cutting to lengths, under 3 ft., to 2 ft., inclusive	.25
Cutting to lengths, under 2 ft., to 1 ft., inclusive	.50
Cutting to lengths, under 1 ft.	1.55
No charge for cutting to lengths 3 ft. and over.	

**Wire Rods and Wire.**—Bessemer, open-hearth and chain rods, \$25.50. Fence wire, Nos. 0 to 9, per 100 lb., terms 60 days or 2 per cent. discount in 10 days, carload lots to jobbers, annealed, \$1.35; galvanized, \$1.75. Galvanized barb wire, to jobbers, \$1.95; painted, \$1.55. Wire nails, to jobbers, \$1.55. Woven wire fencing, 74 1/2 per cent off list for carloads; 73 1/2 off for 1000 rod lots; 72 1/2 off for less than 1000-rod lots.

The following table gives the price to retail merchants on fence wire in less than carloads, with the extras added to the base price:

## Plain Wire, per 100 lb.

Nos.	0 to 9	10	11	12 & 12 1/2	13	14	15	16
Annealed	\$1.55	\$1.60	\$1.65	\$1.70	\$1.80	\$1.90	\$2.00	\$2.10
Galvanized	2.00	2.00	2.05	2.10	2.20	2.30	2.70	2.80

**Wrought Pipe.**—The following are the jobbers' car-load discounts on the Pittsburgh basing card on steel pipe in effect from October 27, 1913, and iron pipe from June 2, 1913, all full weight:

	Steel.	Iron.			
Inches.	Black.	Galv.	Inches.	Black.	Galv.
1/4, 3/8 and 1/2	.73	52 1/2	1/4 and 3/8	.66	47
1/2	.77	66 1/2	1/2	.65	46
3/4 to 3	.80	71 1/2	3/4 to 2 1/2	.69	56
			2	.72	61
			2 1/2 to 4	.70	61
			4 1/2 to 6	.70	61
			7 to 12	.68	55

	Butt Weld.	Lap Weld.	Reamed and Drifted.		
1 to 3, butt	.78	69 1/2	1 to 1 1/2, butt	.70	59
2, lap	.75	66 1/2	2, butt	.70	59
2 1/2 to 6, lap	.77	68 1/2	1 1/2, lap	.54	43
			1 1/2, lap	.65	54
			2, lap	.66	56
			2 1/2 to 4, lap	.68	59

	Butt Weld, extra strong, plain ends.	Lap Weld, extra strong, plain ends.
1/4, 3/8 and 1/2	.68	57 1/2
1/2	.73	66 1/2
3/4 to 1 1/2	.77	70 1/2
2 to 3	.78	71 1/2

	Butt Weld, double extra strong, plain ends.	Lap Weld, double extra strong, plain ends.
1/4	.63	56 1/2
1/2 to 1 1/2	.66	59 1/2
2 to 2 1/2	.68	61 1/2

The above discounts are subject to the usual variation in weight of 5 per cent. Prices for less than carloads are two (2) points lower basing (higher price) than the above discounts on black and three (3) points on galvanized.

**Boiler Tubes.**—Discounts to jobbers, in carloads on lap-welded steel, in effect from May 29, 1913, and standard charcoal-iron boiler tubes, in effect from January 1, 1913, are as follows:

Lap-Welded Steel.	Standard Charcoal Iron.
1 1/2 and 2 in.	.60 1 1/2 in.
2 1/2 in.	.57 2 in.
2 1/2 and 3 1/2 in.	.63 2 1/2 in.
3 and 3 1/2 in.	.67 2 1/2 and 3 1/2 in.
3 1/2 to 4 1/2 in.	.69 3 and 3 1/2 in.
5 and 6 in.	.63 3 1/2 to 4 1/2 in.
7 to 13 in.	.60 7 to 13 in.

2 1/2 in. and smaller, over 18 ft., 10 per cent. net extra.  
2 1/2 in. and larger, over 22 ft., 10 per cent. net extra.

Less than carloads will be sold at the delivered discounts for carloads, lowered by two points for lengths 22 ft. and under to destinations east of the Mississippi River; lengths over 22 ft., and all shipments going west of the Mississippi River must be sold f.o.b. mill at Pittsburgh basing discount, lowered by two points.

**Sheets.**—Makers' prices for mill shipment on sheets of U. S. Standard gauge, in carload and larger lots, on which jobbers charge the usual advance for small lots from store, are as follows, f.o.b. Pittsburgh, terms 30 days net or 2 per cent. cash discount in 10 days from date of invoice:

	Blue Annealed Sheets.
Nos. 3 to 8	.45 to 1.50
Nos. 9 and 10	1.50 to 1.55
Nos. 11 and 12	1.55 to 1.65
Nos. 13 and 14	1.60 to 1.70
Nos. 15 and 16	1.70 to 1.75

	Box Annealed Sheets, Cold Rolled.
Nos. 10 and 11	1.60 to 1.65
No. 12	1.60 to 1.65
Nos. 13 and 14	1.65 to 1.70
Nos. 15 and 16	1.70 to 1.75
Nos. 17 to 21	1.75 to 1.80
Nos. 22 and 24	1.80 to 1.85
Nos. 25 and 26	1.85 to 1.90
No. 27	1.90 to 1.95
No. 28	1.95 to 2.00
No. 29	2.00 to 2.05
No. 30	2.10 to 2.15

	Galvanized Sheets of Black Sheet Gauge.
Nos. 10 and 11	1.95 to 2.00
No. 12	2.05 to 2.10
Nos. 13 and 14	2.05 to 2.10
Nos. 15 and 16	2.20 to 2.25
Nos. 17 to 21	2.35 to 2.40
Nos. 22 and 24	2.50 to 2.55
Nos. 25 and 26	2.65 to 2.70
No. 27	2.80 to 2.85
No. 28	2.95 to 3.00
No. 29	3.10 to 3.15
No. 30	3.25 to 3.30

## Pittsburgh

PITTSBURGH, PA., November 26, 1913.

The chief feature of the situation is the heavy cut that has been made in the production of iron and steel. While some of the larger steel companies are running to probably 75 to 80 per cent. of ingot capacity, others are not doing much better than about 60 per cent. and some less. In the Mahoning and Shenango valleys the output of pig iron has been materially reduced. Furnaces that have gone out recently are Leetonia, Cherry Valley and Canal Dover, of M. A. Hanna & Co.; Mattie, of the Girard Iron Company, and No. 4 stack of the Shenango Furnace Company, Sharpsville, Pa. The Columbus steel works of the Carnegie Steel Company has closed to remain idle until conditions improve. All the other steel works of this company are in operation on limited time, and it is running at present to not over 75 per cent. of ingot capacity. As the mills get nearer the end of the old orders on their books, the necessity for restricting output is more imperative, and, unless conditions improve, operations among the steel mills in the Central West in December will likely be down as low as 50 per cent. The settling in prices to a lower level is still going on, but declines in the past week have not been heavy. How far down they will go is a question, but there is a strong feeling that the low level of early in 1911 will not be reached. As far as can be learned, practically no foreign material has been contracted for to come into this country, except some on the Pacific coast. To meet competition at such seaboard points steel mills would have to name close to 1.05c. on plates, shapes and bars, and they state that they have not done this. The urgency of customers for deliveries is still a dominant feature of the market; one local concern reports that last week it received 315 telegrams urging deliveries of material. Stocks all over the country are at minimum, and more orders are being placed now than for some time, but they are small and it takes many of them to make respectable tonnages. One authority claims that the consumption of steel in this country to-day is 75 to 80 per cent. of capacity of the mills, while new orders do not represent more than 30 to 35 per cent. With this condition existing, there is a belief that the situation will turn quickly and that a good buying movement may start at any time. There have been some large transactions in furnace coke for first half delivery at \$1.80 to \$1.90 per net ton at oven. The scrap market is neglected and prices are weak.

**Pig Iron.**—The Colonial Steel Company, Pittsburgh, which inquired for 1500 tons of basic for December and for 1000 to 1500 tons a month for first quarter, has bought the December iron but deferred buying for first quarter. It is understood that the December iron was bought from a Mahoning Valley furnace at about \$12.85 at furnace, or \$13.45 delivered Colona, Pa. Pig iron is still being piled at a rapid rate; in spite of the reduction in output more iron is being made than is being melted. We quote as follows: Bessemer iron, \$15 to \$15.25; basic, \$12.85 to \$13; No. 2 foundry, \$13.50 to \$13.75; malleable Bessemer, \$13.75 to \$14; gray forge, \$13.35, all at Valley furnace. The freight rate for delivery in the Pittsburgh or Cleveland district from Valley furnace is 90c. a ton.

**Billets and Sheet Bars.**—The low prices ruling for steel are causing buyers to take more interest in the market, and it is stated that some large consumers are willing to contract for their supply for first half on the basis of about \$20.50 for Bessemer and open-hearth billets and about \$21 for sheet bars. Sales of a fairly large tonnage of billets are said to have been made for first half at close to \$20.50, Pittsburgh, freight to mill added. Some of the smaller mills continue to offer billets and sheet bars in limited quantities for prompt delivery at low prices. We quote Bessemer and open-hearth 4 x 4-in. billets, at \$20.50, and Bessemer or open-hearth sheet bars at \$21, Pittsburgh or Youngstown mills. Sales of forging billets have been made at \$26 and axle billets are held at about \$24, Pittsburgh.

**Muck Bar.**—The new demand is quiet, but the supply is more plentiful. We quote best grades of muck bar made from all pig iron at about \$31, Pittsburgh.

**Steel Rails.**—Some small orders are being placed for standard sections for quick delivery, but the leading railroads have not yet come in the market to any extent for next year. The prosperous condition of the coal trade is reflected in a continued active demand for light rails, the Carnegie Steel Company having booked close to 2500 tons in new orders and specifications in the past week. Rerolling rail mills are offering re-rolled rails at about \$2 a ton under prices quoted for light rails rolled from billets. We quote splice bars

at 1.50c. per lb. and standard section rails at 1.25c. per lb. Light rails are quoted as follows: 25, 30, 35, 40 and 45 lb. sections, 1.25c.; 16 and 20 lb., 1.30c.; 12 and 14 lb., 1.35c., and 8 and 10 lb., 1.40c., all in carload lots, f.o.b. Pittsburgh.

**Plates.**—No orders of moment for steel cars have been placed in the past week, but some fair-sized inquiries are out. It is now claimed that the New York Central will buy only 3000 cars at present, and will defer placing orders for the other 15,000 cars until early next year. Local car companies are pretty well filled up on old contracts to about February, but have little business beyond that date. The new demand for plates is dull and prices continue weak. The larger mills are still holding 3/4-in. and heavier plates at about 1.25c., but some of the smaller mills are selling at 1.20c. in a limited range of sizes and have been doing so for several weeks.

**Structural Material.**—The Fort Pitt Bridge Works is the low bidder at its price of \$248,929, on the new Bloomfield bridge in this city, for which about 3500 tons of steel will be needed. The contract has not been formally awarded, but is expected to be within a few days. This company also took a bridge at Brownsville, Pa., recently, in which 1700 tons of steel will be used. Inquiries are light and a limited amount of new work has been placed. Prices are not strong, and we quote beams and channels up to 15 in. at 1.25c., Pittsburgh, on large lots and 1.30c. on small lots.

**Wire Rods.**—The market is dull and prices are weak. We quote Bessemer, open-hearth and chain rods at \$25.50, Pittsburgh, and on desirable tonnage, this price could probably be shaded.

**Ferroalloys.**—Only an occasional carload lot is being sold. Prices on English 80 per cent. ferromanganese are reported firm at \$50, and German about \$49. Baltimore, the freight rate to Pittsburgh being \$2.16 per ton. We quote 50 per cent. ferrosilicon, in lots up to 100 tons, at \$75; over 100 tons to 600 tons, \$74; over 600 tons, \$73, Pittsburgh. We quote 10 per cent. ferrosilicon at \$22; 11 per cent., \$23, and 12 per cent., \$24, f.o.b. cars Jackson County, Ohio, or Ashland, Ky., furnaces. We quote 20 per cent. spiegeleisen at \$25 at furnace. We quote ferrotitanium at 8c. per lb. in carloads; 10c. in 2000-lb. lots and over.

**Car Wheels.**—The Pennsylvania Railroad which recently ordered 1000 coke cars from the Cambria Steel Company, Johnstown, Pa., has placed 8000 car wheels to equip these cars. The Carnegie Steel Company took 3000 wheels, the Standard Steel Car Company 3000, the Baldwin Locomotive Works 1000 and the Midvale Steel Company 1000.

**Skelp.**—New demand is quiet, but local and Youngstown mills have a good many orders on their books for delivery over the next two or three months. A sale of 1000 tons of narrow grooved skelp is reported at 1.25c. Youngstown mill. We quote grooved steel skelp at 1.25c. to 1.30c.; sheared steel skelp, 1.35c.; grooved iron skelp, 1.60c. to 1.65c., and sheared iron skelp, 1.65c. to 1.70c., Pittsburgh.

**Iron and Steel Bars.**—Reports are in circulation of low prices on steel bars being made by local mills at seaboard points to meet offerings of foreign bars, but several makers say they are not naming such prices, being able to get \$2 to \$3 a ton better than prices at which foreign bars can be laid down at Boston, Galveston and other seaboard points. New demand for reinforcing steel bars is good, and we note a sale of 1600 tons at the reported price of 1.30c. at makers' mill. Local steel bar mills are fairly well filled up over the next month or two on old contracts, but the new demand for some time has been quiet. There is not much doing in iron bars, and the mills are badly in need of orders. We quote steel bars at 1.25c. to 1.30c., and iron bars at 1.40c. to 1.45c., Pittsburgh, but on a desirable order for iron bars, it is probable 1.35c. could be done.

**Sheets.**—Sheet mills report that more new orders are coming in than for some time, but they are all for small lots, which aggregate only a fair tonnage. However, the belief is growing that prices on sheets are probably about as low as they can go, unless there should be a further material decline in prices of sheet bars, which seems not likely. Operations among the sheet mills are at the lowest point for some months, some concerns running to about 50 per cent., and others to probably 60 per cent. of capacity. Several sheet mills are adopting the plan of shutting down for a week or two for orders to accumulate, and then starting up nearly full and rolling them. We quote Nos. 9 and 10 blue annealed sheets at 1.50c.; No. 28 Bessemer black, 1.95c. to 2c.; No. 28 galvanized, 2.95c. to 3c.; No.

28 tin mill black plate, H.R. and A., 1.95c., and Nos. 29 and 30, 2c. for delivery over the remainder of this year, while for first quarter No. 28 black plate is held at 2c. and Nos. 29 and 30 at 2.05c. These prices are f.o.b. Pittsburgh in carload and larger lots, jobbers charging the usual advances for small lots from store.

**Tin Plate.**—Contracts are still being placed for bright plate for next year delivery by the can makers and meat packers, and the mills have booked a fair amount of business, but not as heavy as expected when the new price was given out several weeks ago. It is said most of this business was taken at the regular \$3.40 price, and that concessions this year have been lighter than usual. Operations among the tin plate mills have been cut down a good deal, one leading mill having operated to only 50 per cent. of capacity for some time. Others are running at probably 50 to 60 per cent. Tin plate is the one article in finished material that depends less on general conditions than any other line. Should the fruit crop be heavy next year, it would tax the capacity of the mills to meet the demand. We quote 100-lb. cokes at \$3.40 and 100-lb. ternes at \$3.30 per base box f.o.b., Pittsburgh.

**Spikes.**—New demand is dull and only for small lots. Railroads are not expected to come in the market until after the first of the year, and all the spike makers are badly in need of new business. We quote railroad spikes in base sizes,  $5\frac{1}{2} \times 9/16$  in., at \$1.50, and small railroad and boat spikes at \$1.55 to \$1.60 per 100 lb. f.o.b., Pittsburgh.

**Bolts and Rivets.**—A fair amount of new business is being placed, mostly in orders for small lots to meet current needs. Consumers of rivets, and also of nuts and bolts, are not showing any desire to anticipate and are buying only as needs require. We quote button-head structural rivets at \$1.75 to \$1.80, and cone-head boiler rivets at \$1.85 to \$1.90, in large lots, an advance of about \$2 a ton over these prices being charged for small lots. Terms 30 days net, less 2 per cent. for cash in 10 days. The discounts on nuts and bolts are as follows: In lots of 300 lb. or over, delivered within a 20c. freight radius of makers' works:

Coach and lag screws.....	80 and 20% off
Small carriage bolts, cut threads.....	75 and 17½% off
Small carriage bolts, rolled threads.....	90 and 2½% off
Large carriage bolts.....	70 and 15% off
Small machine bolts, cut threads.....	80 and 2½% off
Small machine bolts, rolled threads.....	80 and 7½% off
Large machine bolts.....	75 and 10 and 2½% off
Machine bolts, with C.P.C. and T nuts, small,	70 and 12½% off
Machine bolts, with C.P.C. and T nuts, large,	70 and 12½% off
Square hot pressed nuts, blanked and tapped.....	\$.60 off list
Hexagon nuts.....	\$.70 off list
C.P.C. and R square nuts, tapped and blanked.....	\$.80 off list
Hexagon nuts, 5¢ and larger.....	\$.80 off list
Hexagon nuts, smaller than 9/16.....	\$.70 off list
C.P. plain square nuts.....	\$.50 off list
C.P. plain hexagon nuts.....	\$.70 off list
Semi-finished hexagon nuts, 5¢ and larger.....	85 and 10% off
Semi-finished hex. nuts, smaller than 9/16, 25, 10 and 5% off	85 and 10% off
Rivets, 7/16 x 6½, smaller and shorter.....	90 and 10% off
Rivets, metallic tinned, bulk.....	80 and 10% off
Rivets, tin plated, bulk.....	80 and 10% off
Rivets, metallic tinned, packages.....	80 and 10% off
Standard cap screws.....	75, 10, 10 and 7½% off
Standard set screws.....	75, 10, 10 and 7½% off

**Shafting.**—New demand continues quiet and only for small lots to meet current needs. Makers state that specifications against contracts are dull, and the present new demand for shafting is not more than about 30 per cent. of capacity. We quote cold rolled shafting at 63 per cent. off in carloads and larger lots, but on desirable business, one or two points better would be named. Small lots are held at about 60 per cent. off, delivered in base territory.

**Hoops and Bands.**—Some fairly large orders for hoops have been placed in the past week and we note sales of about 1500 tons on the basis of 1.45c., Pittsburgh. The new demand for bands is quiet, and in sympathy with steel bars, prices are weak. We quote steel bands at 1.25c. to 1.30c., with extras as per the steel bar card, and steel hoops at 1.45c. to 1.50c., Pittsburgh.

**Wire Products.**—The buying season is about over, and not much new business is coming out. Specifications against contracts are fair, but prices on all kinds of wire products are weak, and are showing a tendency to seek a lower level. We quote wire nails to jobbers at \$1.55; cut nails, \$1.55; plain annealed wire, \$1.35; galvanized barb wire, \$1.95, and painted barb wire, \$1.55, f.o.b. Pittsburgh, per 100 lb., usual terms, actual freight added to point of delivery. To some competitive points, notably those served by Ohio River mills, these prices have been slightly shaded. We quote woven wire fencing at 74½ per cent. off in carload lots; 73½ per cent. off on 1000-rod lots, and 72½ per cent. on less than 1000-rod lots, all f.o.b. Pittsburgh.

**Merchant Steel.**—Only small orders are being placed to meet current needs, and there has been a heavy falling off in specifications. Prices are being shaded when any desirable business comes up, and the market is weak. We quote: Iron finished tire,  $1\frac{1}{2} \times \frac{1}{2}$  in. and larger, 1.35c., base; under  $1\frac{1}{2} \times \frac{1}{2}$  in., 1.50c.; planished tire, 1.55c.; channel tire,  $\frac{3}{4}$  to  $\frac{1}{2}$  in. and 1 in., 1.85c. to 1.95c.;  $1\frac{1}{2}$  in. and larger, 1.95c.; toe calk, 1.95c. to 2.05c., base; flat sleigh shoe, 1.70c.; concave and convex, 1.75c.; cutter shoe, tapered or bent, 2.25c. to 2.35c.; spring steel, 1.95c. to 2.05c.; machinery steel, smooth finish, 1.80c. We quote cold-rolled strip steel as follows: Base rates for 1 in. and  $1\frac{1}{2}$  in. and wider, under 0.20 carbon, and No. 10 and heavier, hard temper, 3.25c.; soft, 3.50c.; coils, hard, 3.15c.; soft, 3.40c.; freight allowed. The usual differentials apply for lighter gauges and sizes.

**Standard Pipe.**—Inquiries are in the market from a Texas natural gas interest for 40 miles of 12-in. pipe and about 20 miles of smaller sizes for prompt delivery. Local and Youngstown pipe mills are figuring on this inquiry, and it may be given out in a short time. The current demand for butt weld and lap weld steel pipe is holding up very well, and the new demand for iron pipe is also better than usual at this season of the year. However, in December a falling off in demand for merchant pipe is expected, as a good deal of outside work will no doubt stop before the first of the year. The Kansas Natural Gas Company, which is expected to spend \$1,000,000 in betterments in the near future, has not yet come in the market with any active inquiries. It is claimed the discounts on iron and steel pipe, printed on page 1229, are being very well held.

**Boiler Tubes.**—New demand is light, and competition among mills for the small amount of business being placed has resulted in a material shading in discounts on steel and charcoal iron boiler tubes. Railroads are not doing much buying, but a heavier business is looked for after the first of the year.

**Iron and Steel Scrap.**—Present conditions in the scrap trade are about as bad in every way as they could be. Consumers seem to have all the scrap they will need for some time, and the very low prices ruling on all grades do not tempt them. Consumption has materially fallen off, by reason of the lighter operations of the steel mills, and an embargo is on at one prominent consuming point. A new customer for heavy steel melting scrap is the Brier Hill Steel Company at Youngstown, which has started one or two of its open-hearth furnaces and expects to put more on after the first of the year. A sale of 1200 tons of heavy steel scrap is reported at \$11.25 at makers' mill, and we note a sale of 300 tons of bundled sheet scrap at less than \$6 at loading point. Dealers are quoting about as follows per gross ton for delivery in the Pittsburgh and other districts:

Selected heavy steel scrap, Steubenville,	.
Follansbee, Brackenridge, Sharon, Monessen, Midland and Pittsburgh delivery	\$11.25 to \$11.50
Compressed side and end sheet scrap	10.25
No. 1 foundry cast	12.00 to 12.25
No. 2 foundry cast	10.75 to 11.00
Bundled sheet scrap, f.o.b. consumers' mills, Pittsburgh district	6.50 to 6.75
Rolling rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin, Pa.	13.50 to 13.75
No. 1 railroad malleable stock	11.25 to 11.50
Grate bars	7.50 to 7.75
Low phosphorus melting stock	14.00 to 14.25
Iron car axles	24.25 to 24.75
Steel car axles	17.25 to 17.50
Locomotive axles, steel	20.75 to 21.25
Locomotive axles, iron	25.25 to 25.75
No. 1 busheling scrap	11.25
No. 2 busheling scrap	7.00
*Machine shop turnings	6.50
Old carwheels	13.00 to 13.25
*Cast-iron borings	7.25 to 7.50
*Sheet bar crop ends	13.50 to 13.75
Old iron rails	14.25 to 14.50
No. 1 railroad wrought scrap	13.50 to 13.75
Heavy steel axle turnings	8.75 to 9.00
Stove plate	7.50 to 7.75

\*These prices are f.o.b. cars at consumers' mills in the Pittsburgh district.  
†Shipping point.

**Coke.**—In the past week or two some good-sized contracts for standard grades of furnace coke, probably aggregating close to 200,000 tons, have been placed for delivery over first half of 1914 at prices ranging from \$1.80 to \$1.90 per net ton at oven. Most of this business was closed at \$1.85 to \$1.90, but in one case \$1.80 was named. Some coke makers are refusing to meet these prices and are holding their coke at \$2.15 to \$2.25, at oven, for first half of next year delivery. Reports of contracts for coke having been made at \$2.15 are strongly denied, as only coke of special analysis, running very low in sulphur, would bring this price. A number of Valley blast furnace operators are figuring on their coke for first half of next year, and a good deal of busi-

ness is expected to be closed between now and December 15. A good many ovens have been blown out, and production of coke is lighter now than for some months. We quote strictly standard blast furnace coke for delivery over remainder of the year at \$1.75 to \$1.85, and best grades of 72-hr. foundry coke at \$2.50 to \$2.65 to consumers per net ton at oven. The output of coke in the Upper and Lower Connellsburg regions last week was 336,062 tons, the lightest output in any one week for some months, and a decrease over the previous week of 17,983 tons.

## Chicago

CHICAGO, ILL., Nov. 26, 1913.—(By Telegraph.)

The promise of activity in pig iron which last week began to appear has in a small way taken tangible form. An inquiry for 6000 tons of basic is perhaps the item of greatest interest, but some of the furnaces report more inquiry for moderate lots from numerous sources. Concerning steel products, the market has little to offer of a cheerful nature. The week was almost devoid of new business, although specifications in a few instances were reported as more liberal. This was particularly true of sheets, of which a fair tonnage was booked. Lower prices are more general for plates, sheets and wire products, the basis of 1.20c., Pittsburgh, for sheared plates being available to close buyers on desirable specifications, even for moderate tonnages. Steel bars, structural shapes and universal mill plates are less readily obtainable at concessions and are generally quotable at 1.43c. to 1.48c., Chicago. The trade in general is seeking some consolation in the fact that December is normally a month of quiet business, but the fact that buyers are not even exhibiting their usual concern regarding their needs following January 1 cannot be escaped. Indecision as to the future was never more pronounced. The reports of curtailed working forces from many directions are generally correct.

**Pig Iron.**—The local market is on the threshold of an active situation in which pig iron tonnage will undoubtedly be placed at lower prices than can now be quoted in advance of actual sales. As yet this is more true of Northern iron than of Southern iron, and of basic than malleable or gray iron. The furnace position has been concededly weak as regards basic, and negotiations during the past week have brought out some decidedly low prices. It is not likely that the inquiry of the Commonwealth Steel Company for 6000 tons of Northern basic is traceable to this condition. Other less specific inquiries are also reported, but sales of malleable and gray iron have been limited to carload and other small lots. A few sales of Southern iron are noted and one inquiry for 600 tons is reported. Sales in this territory have brought out no lower prices than \$11, Birmingham, for No. 2 and carload lots have been placed on the basis of \$11.25. More or less iron slightly off grade in analysis has been moving at prices which represent considerable concessions from the basis of \$15, f.o.b. local furnace. The following quotations are for iron delivered at consumers' yards, except those for Northern foundry, malleable Bessemer and basic iron, which are f.o.b. furnace and do not include a local switching charge averaging 50c. a ton:

Lake Superior charcoal, Nos. 1, 2, 3, 4....	\$15.25 to \$15.75
Northern coke foundry, No. 1.....	15.00 to 15.50
Northern coke foundry, No. 2.....	14.75 to 15.00
Northern coke foundry, No. 3.....	14.25 to 14.75
Southern coke, No. 1 foundry and No. 1 soft	15.60 to 16.15
Southern coke, No. 2 foundry and No. 2 soft	15.10 to 15.60
Southern coke, No. 3.....	14.60 to 15.10
Southern coke, No. 4.....	14.10 to 14.60
Southern gray forge.....	14.10 to 14.60
Southern mottled.....	13.60 to 14.10
Malleable Bessemer.....	14.75 to 15.00
Standard Bessemer.....	17.65
Basic.....	14.50 to 15.00
Jackson Co. and Kentucky silvery, 6 per cent.....	18.40
Jackson Co. and Kentucky silvery, 8 per cent.....	19.40
Jackson Co. and Kentucky silvery, 10 per cent.....	20.40

(By Mail)

**Rails and Track Supplies.**—The railroads have done little the past week beyond emphasizing their almost unprecedented prejudice against purchasing. The covering of requirements, even on the most conservative scale, is being neglected. Immediate needs are responsible for a few minor transactions, but attractive quotations, some of which have touched cost levels, have availed nothing as a stimulant to future buying. We now quote standard railroad spikes at 1.65c. to 1.70c., base; track bolts with square nuts, 2.10c. to 2.15c.; base, all in carload lots, Chicago; tie plates, \$30 to \$32 net

ton; standard section Bessemer rails, Chicago, 1.25c., base; open hearth, 1.34c.; light rails, 25 to 45 lb., 1.25c.; 16 to 20 lb., 1.30c.; 12 lb., 1.35c.; 8 lb., 1.40c.; angle bars, 1.50c., Chicago.

**Structural Material.**—Reports regarding quotations now being made for fabricated steel hint at some very low prices, one contract in particular, for about 1200 tons, carrying figures that suggest very favorable quotations on the plain shapes. Contracts placed this week, which were few, included 264 tons of bridge steel for the Illinois Central Railroad at Galena, Ill., to be furnished by the American Bridge Company, and 300 tons for the Chicago & Eastern Illinois for its shops at Danville, Ill., which will be fabricated by the Morava Construction Company. The Oregon Short Line Railroad was also in the market for 120 tons for shop buildings at Pocatello, Idaho. In quoting on the few miscellaneous inquiries developing in the market the mills have retained a semblance of firmness, and the ordinary transaction is made on the basis of 1.30c., Pittsburgh, with the close buyer doing \$1 a ton better even though the tonnage is not large. For Chicago delivery from mill we quote 1.43c. to 1.48c.

Buying from store is routine and we quote for Chicago delivery 1.85c.

**Plates.**—Sheared plates continue to lead in the downward trend of prices, while universal mill plates are quotable on about the same basis as structural material. Ordinary plate business can now be placed for prompt shipment at 1.43c., Chicago, and regular customers who have had desirable specifications to offer in 100 and 200 ton lots have been able to do 1.38c. Practically no new car buying of importance has appeared. We quote for Chicago delivery from mill 1.38c. to 1.48c.

Those who buy regularly through local jobbers are pressing their claims for most favorable prices, particularly on mill shipment orders, but store orders are filled without much disturbance as regards price. We quote for Chicago delivery from store 1.85c.

**Sheets.**—A more favorable report is had regarding tonnage in connection with sheets than any of the other principal products. The local independent maker is taking enough business to keep its mills up to a fairly high rate of operation. Prices have not changed much during the week except in that 2.10c. for 28 black and 3.10c. for 28 galvanized at Chicago are a little more common. We quote for Chicago delivery from mill: No. 10 blue annealed, 1.73c.; No. 28 black, 2.10c. to 2.13c.; No. 28 galvanized, 3.10c. to 3.13c.

Current prices on sheets out of store are as follows for Chicago delivery: No. 10 blue annealed, 2.05c.; No. 28 black, 2.65c.; No. 28 galvanized, 3.70c.

**Bars.**—Additional bar-iron business continues to appear in sufficient volume to keep at least one local mill operating almost to capacity rate, and prices are in the light of the general situation quite well established. Steel-bar specifications were released with a little greater liberality last week, but new orders were few and far apart. Despite the absence of new business, bars continued to be held more firmly than plates, and quotations below 1.30c. are for the most part confidential. We quote for mill shipment as follows: Bar iron, 1.15c. to 1.20c.; soft steel bars, 1.43c. to 1.48c.; hard steel bars, 1.35c. to 1.40c.; shafting in carloads, 60 per cent. off; less than carloads, 55 per cent. off.

Store prices for iron and steel bars for Chicago delivery are: Soft steel bars, 1.75c.; bar iron, 1.75c.; reinforcing bars, 1.75c. base, with 5c. extra for twisting in sizes  $\frac{1}{2}$  in. and over, and usual card extras for smaller sizes; shafting 55 per cent. off.

**Rivets and Bolts.**—The only matter of interest remaining in the transaction in which rivets and bolts are involved is the extent of the concession the buyer is able to secure. Rivet quotations have declined to the basis of 1.65c. and 1.70c. Pittsburgh for Chicago delivery. We quote from mill as follows: Carriage bolts up to  $\frac{3}{8}$  x 6 in., rolled thread, 80-2½; cut thread, 75-17½; larger sizes, 70-15; machine bolts up to  $\frac{3}{8}$  x 4 in., rolled thread, 80-7½; cut thread, 80-2½; large size, 75-2½; c.c. bolts, 80-10-10; hot pressed nuts, square head, \$6 off per cwt.; hexagon, \$6.70 off per cwt. Structural rivets,  $\frac{1}{2}$  to  $\frac{1}{4}$  in., 1.88c., base, Chicago, in carload lots; boiler rivets, 10c. additional.

Out of store we quote for structural rivets, 2.70c., and for boiler rivets, 2.90c. Machine bolts up to  $\frac{3}{8}$  x 4 in., 70-5-10; larger sizes, 70-7½; carriage bolts up to  $\frac{3}{8}$  x 6 in., 75-5; larger sizes, 70-7½ off. Hot pressed nuts, square head, \$5.50, and hexagon, \$6.20 off per cwt.

**Wire Products.**—Wire products have not escaped the depressing influences so generally at work in the iron and steel trade. Stocks in the warehouses of producers have increased in inverse proportion to the leanness of jobbers' and retailers' holdings. For the first time in a number of years it is expected that sev-

eral of the wire mills will be shut down throughout Thanksgiving holidays, or from Wednesday night to Monday. Under pressure quotations of wire and nails are reported to have involved concessions of \$1 a ton in a number of instances, which fact may have been responsible for somewhat improved tonnage reports for the past week. We quote to jobbers as follows: Plain wire, No. 9 and coarser, base, \$1.53 to \$1.58; wire nails, \$1.73 to \$1.78; painted barb wire, \$1.73 to \$1.78; galvanized, \$2.10 to \$2.15; polished staples, \$1.73 to \$1.78; galvanized, \$2.05 to \$2.10, all Chicago.

**Cast-Iron Pipe.**—With the exception of 500 tons of pipe for Beatrice, Neb., awarded to the United States Cast Iron Pipe & Foundry Company, municipal lettings during the week were lacking in importance. Inquiry for gas pipe has begun to appear, and it is expected that December will witness the closing of a round tonnage. We revise our quotations and quote as follows, per net ton, Chicago: Water pipe, 4-in., \$27; 6 to 12 in., \$25; 16 in. and up, \$24, with \$1 extra for gas pipe.

**Old Material.**—Melters of scrap are taking in of what is offered only that material which is made especially attractive by reason of price concessions. The weight of liberal selling of some grades by the railroads, particularly steel rails, iron axles and No. 1 wrought, have emphasized the weakness of these items. Additional railroad lists to be closed this week include 3000 tons from the Chicago, Burlington & Quincy, 4400 tons from the Chicago, Rock Island & Pacific and 2000 tons from the Northern Pacific. Among the large items on these lists are 1500 tons of railroad wrought and 1200 tons of No. 1 steel rails. It is understood that the Chicago, Milwaukee & St. Paul sold 1500 tons of steel rails last week. In our quotations of this week some additional declines are noted. We quote for delivery at buyers' works, Chicago and vicinity, all freight and transfer charges paid, as follows:

<i>Per Gross Ton.</i>	
Old iron rails	\$13.50 to \$14.00
Old steel rails, rerolling	11.75 to 12.25
Old steel rails, less than 3 ft.	11.00 to 11.50
Relying rails, standard section, subject to inspection	24.00
Old carwheels	12.00
Heavy melting steel scrap	9.50 to 10.00
Frogs, switches and guards, cut apart	9.50 to 10.00
Shoveling steel	8.75 to 9.25
Steel axle turnings	6.50 to 7.00

<i>Per Net Ton.</i>	
Iron angles and splice bars	\$12.00 to \$12.50
Iron arch and transoms	12.00 to 12.50
Steel angle bars	8.25 to 8.75
Iron car axles	18.00 to 18.50
Steel car axles	12.50 to 13.00
No. 1 railroad wrought	9.00 to 9.25
No. 2 railroad wrought	8.25 to 8.50
Cut forge	8.25 to 8.50
Steel knuckles and couplers	9.00 to 9.50
Steel springs	9.50 to 10.00
Locomotive tires, smooth	10.50 to 11.00
Machine shop turnings	4.50 to 4.75
Cast borings	4.25 to 4.75
No. 1 busheling	7.75 to 8.00
No. 2 busheling	6.00 to 6.50
No. 1 boilers, cut to sheets and rings	6.00 to 6.50
Boiler punchings	10.25 to 10.75
No. 1 cast scrap	10.00 to 10.50
Stove plate and light cast scrap	9.25 to 9.75
Railroad malleable	9.25 to 9.75
Agricultural malleable	8.50 to 9.00
Pipes and flues	6.75 to 7.00

## Philadelphia

PHILADELPHIA, PA., November 25, 1913.

New business could scarcely be less. Orders in most lines continue to fall off, but in a few cases specifications against contracts have been a trifle better. Fifty per cent. capacity represents about the average rate of operations at finished iron and steel mills. Although here and there a plant is found still running at capacity, in such cases orders for forward delivery are usually pretty light. The threatened shut-down of the leading local billet mill was averted last week by the receipt of increased specifications. A slightly better volume of small business has been coming out in plates and shapes, prices of which have become easier. Pig iron is quiet. Prices have been stationary owing to the lack of demand, but would probably recede on a good inquiry. Further sales of standard low phosphorus pig iron have been made at \$22, delivered, while trial lots of foreign low phosphorus have been sold at \$21.50 delivered at nearby points. Coke remains unchanged. Old material is dull, with little change in prices.

**Iron Ore.**—Buyers show no interest in the market. Importations during the week ended November 22 included 13,953 tons from Sweden, 6208 tons from Spain and 5000 tons from New Brunswick.

**Pig Iron.**—Week after week the volume of new business coming to sellers has continued to decline and the tonnage taken by some makers last week was the smallest in a long time. While consumers take deliveries on orders freely, they appear determined to maintain a conservative buying policy, merely taking small quantities to piece out. There has been practically no change in prices, due to the absence of inquiries which would really test the market and also to the fact that sellers are pretty well sold up at the present rate of production for the remainder of the year. Cost of production is being closely approached, and therefore makers are not anxious to force business, which would only result in lower prices. Standard brands of No. 2 X eastern Pennsylvania foundry have been sold in small lots only, few individual sales having exceeded 100 tons. Low grade foundry iron is still in demand. Revised quotations are being asked for 6000 tons of pipe-making grades for a Delaware River consumer, which has been before the trade for several weeks. Negotiations are reported still under way for several thousand tons of low grade iron for a Virginia pipe maker. While the leading maker of cast-iron pipe is understood to be in the market for a considerable tonnage of iron for next year's delivery, authentic information as to purchases made is unobtainable. Transactions in Virginia foundry iron have been confined to odd lots for early shipment. A Schuylkill Valley rolling mill is credited with buying several thousand tons of gray forge for near future delivery. General demand for this grade has been light. An interesting feature in the market for steel-making irons was the sale of several trial lots of foreign low phosphorus pig iron to consumers in this district. Sales aggregated about 300 tons at close to \$21.50 delivered at points taking not over \$1 freight from local dock. Domestic standard analysis low phosphorus continues in fair demand, sales aggregating about 1000 tons at a price equal to \$22 delivered in buyers' yards in this district. An inquiry for 2400 tons of basic iron for delivery over the first half for a tin plate maker with a Western mill is before the trade, but will no doubt be placed with Western basic makers. Consumers of basic in this district show no interest in the market and quotations are nominal. The following quotations represent the market for small lot business in standard brands, delivered in buyers' yards in this district: —

Eastern Pennsylvania No. 2 X foundry	\$15.50 to \$15.75
Eastern Pennsylvania No. 2 plain	15.25 to 15.50
Virginia No. 2 X foundry	15.80 to 16.00
Virginia No. 2 plain	15.55 to 15.75
Gray forge	14.75 to 15.00
Basic (nominal)	15.00 to 15.25
Standard low phosphorus	22.00 to 22.25

**Ferroalloys.**—In 80 per cent. ferromanganese odd carloads made up the bulk of the business moving. English ferromanganese for either prompt or forward delivery continues to be held at \$50, seaboard, while German is quoted from \$49 to \$49.50. Consumers show little interest in ferromanganese for extended forward shipment. Importations of ferromanganese last week were only 100 tons. Little inquiry beyond an occasional carload comes out for ferrosilicon.

**Billets.**—Urgent calls for specifications made by the leading billet maker in this district resulted in the receipt of sufficient tonnage to keep the plant on about a half capacity basis this week, at the expiration of which the same situation will be confronted and cessation of operations is likely. New business is practically at a standstill, buyers being apparently totally disinterested. Quotations are nominal at \$22.00 delivered here for basic open-hearth rolling steel, with \$4 to \$5 advance for ordinary analysis specification forging steel.

**Plates.**—The situation has scarcely improved. Mill operations continue on the basis of about 50 per cent. of capacity and new business is largely of the hand-to-mouth order. In few instances have individual orders exceeded 100 tons, although a contract covering several thousand tons of ship plates is expected to be placed in the near future. Prices have been easier; on moderate-sized lots down to 1.40c. delivered here has been done, but some Eastern mills endeavor to obtain 1.45c. on miscellaneous business.

**Structural Material.**—It is understood that the contract for the steel work for the new Penn Square Building for the Finance Company of Pennsylvania, about 2000 tons, has been placed with the leading interest. Bids are going in on 700 tons for a school building in Washington, D. C. Several moderate contracts for bridge and building work have been let to fabricators in this district. Miscellaneous business in plain shapes has been light and prices continue irregular, quotations ranging from 1.40c. to 1.45c., delivered in this vicinity.

**Sheets.**—The demand has been irregular, but Eastern mills are picking up enough business from day to day to enable them to continue operating at practically full capacity. Orders are usually small and for early delivery. Prices show a further recession, No. 10 blue annealed sheets being quoted at 1.60c. to 1.65c. delivered here, depending on the quantity ordered.

**Bars.**—The dullness which has recently characterized the demand for both steel and iron bars, is more pronounced. Consumers show little interest in the market and makers refrain from forcing business. Trade is principally in small lots for early delivery. Prices are weak. Steel bars are held at 1.45c. delivered here while ordinary iron bars are available at 1.27½c. to 1.32½c. delivered in this district, with the better grades commanding up to 1.37½c.

**Coke.**—Business has been quieter. Odd sales of prompt furnace coke have been made at \$1.85 to \$1.90 at oven, but offerings have been less freely made. Transactions in forward furnace coke are still held up, owing to consumers' unwillingness to pay the prices asked by makers. In foundry coke a small volume of business is moving at unchanged prices. The following range of prices is named, per net ton, for deliveries in buyers' yards in this vicinity:

Connellsville furnace coke .....	\$4.00 to \$4.40
Connellsville foundry coke .....	4.90 to 5.35
Mountain furnace coke .....	3.80 to 4.10
Mountain foundry coke .....	4.60 to 4.85

**Old Material.**—Owing to reduced mill operations, consumers of old material are practically out of the market, although occasionally taking on small cheap lots. In heavy melting steel scrap transactions are almost exclusively between dealers who pay \$10.25 to \$10.50 for No. 1 steel for delivery against old contracts, undelivered portions of which consumers promptly cancel unless shipped according to contract. Rolling mill grades of old material are particularly quiet. Special grades, such as old iron and steel axles, are at a standstill. Quotations are largely nominal, the following range about representing prices at which business could be done, delivered in buyers' yards in this district, covering eastern Pennsylvania and taking freight rates varying from 35c. to \$1.35 per gross ton:

No. 1 heavy melting steel .....	\$10.00 to \$10.50
Old steel rails, rerolling (nominal) .....	12.50 to 13.00
Low phosphorus heavy melting steel scrap (nominal) .....	14.00 to 14.50
Old steel axles (nominal) .....	15.75 to 16.00
Old iron axles (nominal) .....	21.00
Old iron rails (nominal) .....	17.00
Old carwheels .....	12.00 to 12.50
No. 1 railroad wrought .....	13.00 to 13.50
Wrought-iron pipe .....	8.50 to 9.00
No. 1 forge fire .....	7.50 to 8.00
No. 2 light iron (nominal) .....	5.00
No. 2 busheling (nominal) .....	7.50 to 8.00
Wrought turnings .....	7.00 to 7.50
Cast borings .....	7.50 to 8.00
Machinery cast .....	12.50 to 13.00
Grate bars, railroad .....	9.00 to 9.50
Stove plate .....	9.50 to 10.00
Railroad malleable (nominal) .....	10.00 to 10.50

## Cleveland

CLEVELAND, OHIO, November 25, 1913.

**Iron Ore.**—The ore shipping season is practically over. Some of the shippers sent their last cargoes down the lakes last week and others are cleaning up this week. The shipments of a few small cargoes that were delayed because of the recent storm is planned for late this week. The last cargoes will leave Lake Superior ports Saturday. The November movement has been light. Ore firms look for a late buying movement for 1914. Last year ore buying started in about November 20 and in the last 10 days of that month and the first week in December practically all the ore for the season was sold. We quote prices as follows: Old range Bessemer, \$4.40; Mesaba Bessemer, \$4.15; old range non-Bessemer, \$3.50; Mesaba non-Bessemer, \$3.40.

**Pig Iron.**—Neither producers nor consumers are taking any interest in the market. Sellers seem indifferent as to placing any orders on their books at the present prices and are not soliciting business. Additional furnaces will probably be blown out unless conditions improve soon. The consumption by foundries has dropped off considerably in the past few weeks and sellers are looking for instructions to hold back on shipments. That there have been very few shipping orders held up thus far is attributed largely to the fact that some of the furnaces got behind on shipments during the recent storm. Because of the decrease in melting

many foundries will have enough last quarter iron to last them a few weeks in the new year. Sales reported consist of a few small lots. Local prices are unchanged at \$14 at furnace for No. 2 foundry for Cleveland delivery. While there are reports that Southern iron has been offered at \$10.50, Birmingham, for No. 2, it is claimed that this is resale iron. Most Southern producers are holding at \$11, Birmingham, for December and first quarter delivery and a local sale of 150 tons of No. 4 is reported at \$10, or on the \$11 basis for No. 2. We quote, delivery Cleveland, as follows:

Bessemer .....	\$16.15
Basic .....	14.00
Northern No. 2 foundry .....	\$14.25 to 14.50
Southern No. 2 foundry .....	14.85 to 15.35
Gray forge .....	14.00
Jackson County silvery, 8 per cent. silicon .....	18.55

**Coke.**—The market is inactive. Some standard Connellsville foundry coke has been sold at \$2.75 per net ton at oven for delivery during December and the first quarter. This price fairly represents the market, although some grades are being quoted as low as \$2.50. Blast furnaces are awaiting market development and are now inquiring for prices on furnace coke for delivery after January 1. We quote standard furnace coke at \$1.80 to \$1.85 for prompt shipment.

**Old Material.**—The market continues very dull and in spite of the recent low prices quotations have been further reduced on a few grades. A local mill has purchased 500 tons of heavy melting steel stock at \$10 and smaller lots at the same price. This scrap usually commands from 50c. to \$1 a ton above regular heavy melting steel. Quotations on several grades are nominal owing to the absence of transactions. We quote f.o.b. Cleveland as follows:

Per Gross Ton.	
Old steel rails, rerolling .....	\$12.00 to \$12.50
Old iron rails .....	12.50 to 13.00
Steel car axles .....	16.50 to 17.00
Heavy melting steel .....	9.25 to 9.50
Old carwheels .....	11.50 to 12.00
Relaying rails, 50 lb. and over .....	23.00 to 25.00
Agricultural malleable .....	9.00 to 9.50
Railroad malleable .....	10.00 to 10.50
Light bundled sheet scrap .....	6.50 to 7.00
Bundled tin scrap .....	11.00 to 11.50

Per Net Ton.	
Iron car axles .....	\$18.00 to \$19.00
Cast borings .....	5.50 to 5.75
Iron and steel turnings and drillings .....	4.25 to 4.50
Steel axle turnings .....	3.75 to 6.00
No. 1 busheling .....	8.25 to 8.75
No. 1 railroad wrought .....	9.50 to 10.00
No. 1 cast .....	10.50 to 11.00
Stove plate .....	8.00 to 8.50

**Finished Iron and Steel.**—A few good orders and inquiries came out during the week, but generally the market continues dull and prices in some cases are lower. The output is being further curtailed and several of the local mills that will shut down Wednesday for Thanksgiving will not start up until next Monday. There is a moderate volume of orders, but these are practically all for small lots. Buyers as a rule are ordering only for their immediate needs. A local consumer has an inquiry out for 4000 to 5000 tons of billets for delivery 1000 tons per month beginning in January. While some prices have been named that are below recent quotations, it is understood that the buyer is holding out for a \$20 delivered price, equivalent to \$18.50 Pittsburgh. Apparently so low a quotation has not yet been made. Local mills have taken at a low price for prompt shipment an order from a Dayton, Ohio, car manufacturer for 1000 tons of bar iron. The Baltimore & Ohio Railroad has purchased 2000 tons of plates and steel bars, a portion of the latter for nearby delivery going to a local mill at 1.25c., Pittsburgh. The Carnegie Steel Company has sold 1000 tons of plates and shapes to the American Shipbuilding Company for a new boat. Steel bars are generally quoted at 1.30c., Pittsburgh, but desirable orders will bring out lower prices. Plates are quoted at 1.25c. to 1.30c., Pittsburgh, for carloads, but a round inquiry will bring out a 1.20c. price. A local plate mill is getting sufficient business to keep it running a little over half the time. Considerable demand is expected for plates in the next few weeks for repair work on lake boats damaged in the recent storm and for new boats. Several lake boats will probably be built to replace those that were lost. We quote structural material at 1.30c., but a round lot inquiry would probably bring out a lower price. The John Gilt & Son Company, Cleveland, has taken the general contract for the Missouri State capitol building at Jefferson City. This will require 5000 tons of steel, the sub-contract for which will be let shortly. Bar iron is weak, being

quoted at 1.25c., Cleveland, for small lots. Sheet prices have sagged off. Regular prices of 2c. for No. 28 black and 3c. for No. 28 galvanized are being openly shaded \$1 a ton and round lot sales have been made at 1.90c. for black and 2.90c. for galvanized. Blue annealed sheets appear equally weak. Several of the Ohio sheet mills have little tonnage on their books. Warehouse prices are unchanged at 1.90c. for steel bars and 2c. for structural material.

## Cincinnati

CINCINNATI, OHIO, November 25, 1913.—(By Telegraph.)

**Pig Iron.**—New business in this market is very light and there are no large inquiries out for foundry iron. A basic user in the Central West is said to be feeling the market for a six months' supply. Northern foundry and basic are both weak, although if \$13.50, Ironton, has been shaded it was doubtless in a few instances to meet competition from Lake furnaces. While there has been some small buying of foundry iron, the only sale of consequence reported the past week covers 2000 tons of foundry grades, about equally divided between Northern and Southern iron, to a Michigan melter for first half shipment. Several Indiana inquiries, previously mentioned, are yet unclosed, and a central Ohio melter, who is asking for a round tonnage, is also holding off. There is some demand for malleable in St. Louis territory but no contracts have been signed yet. Based on freight rates of \$3.25 from Birmingham and \$1.20 from Ironton we quote, f.o.b. Cincinnati, as follows:

Southern coke, No. 1 foundry and 1 soft.	\$14.25 to \$14.75
Southern coke, No. 2 foundry and 2 soft.	13.75 to 14.25
Southern coke, No. 3 foundry	13.25 to 13.75
Southern, No. 4 foundry	12.75 to 13.25
Southern gray forge	12.25 to 12.75
Ohio silvery, 8 per cent. silicon	18.20 to 18.70
Southern Ohio coke, No. 1	15.70 to 16.20
Southern Ohio coke, No. 2	14.70 to 15.20
Southern Ohio coke, No. 3	14.45 to 14.70
Southern Ohio malleable Bessemer	15.20 to 15.45
Basic, Northern	15.20 to 15.45
Lake Superior charcoal	16.25 to 17.25
Standard Southern carwheel	27.25 to 27.75

(By Mail)

**Coke.**—Curtailment in production is reported from all three districts, being probably most pronounced in the Connellsville region. The demand is exceedingly light, but the reduced supply has tended to strengthen quotations. Standard brands of Connellsville 48-hr. are quoted at \$1.85 to \$2 for prompt shipment, with first half quotations ranging from \$2 to \$2.25. Foundry coke is weaker than furnace coke, and some brands may be secured from two or three operators as low as \$2.50 for this year, with contract business being booked at \$2.75 to \$3. Although there are said to be several contracts open for furnace coke, to cover first half requirements, the furnace operators are now slow to do any buying even that far ahead.

**Old Material.**—There is practically no demand from any source, and as stocks have been accumulating at a rapid rate, prices have weakened on all grades. The minimum figures given below represent what buyers are willing to pay for delivery in their yards, southern Ohio and Cincinnati, and the maximum quotations are dealers' prices f.o.b. at yards:

### Per Gross Ton.

Bundled sheet scrap	\$6.25 to \$6.75
Old iron rails	10.75 to 11.75
Relaying rails, 50 lb. and up	19.50 to 20.00
Rerolling steel rails	10.75 to 11.25
Melting steel rails	9.00 to 9.50
Old carwheels	10.00 to 10.50

### Per Net Ton.

No. 1 railroad wrought	\$8.25 to \$8.75
Cast borings	4.00 to 4.50
Steel turnings	4.00 to 4.50
No. 1 cast scrap	8.50 to 9.00
Burnt scrap	5.75 to 6.25
Old iron axles	15.75 to 16.25
Locomotive tires (smooth inside)	9.50 to 10.00
Pipes and flues	5.50 to 6.00
Malleable and steel scrap	6.50 to 7.00
Railroad tank and sheet scrap	4.00 to 4.50

**Finished Material.**—Business is slow in practically all finished lines, although it is reported that the demand for both black and galvanized sheets is better than for other classes of material. The local mill is still three weeks behind on orders, and reports new business coming in as fairly satisfactory for the season. In comparison with other markets, it is quite probable that the retail business here is better than in other centers, but local warehouse stocks are said to be amply sufficient to take care of nearby needs. The lo-

cal warehouse price on steel bars remains around 1.85c., with structural shapes quoted at 1.90c. to 1.95c., cut to lengths when desired. The carload quotation on No. 28 black sheets is 2.15c. and on galvanized sheets 3.15c., f.o.b. cars Cincinnati.

## Birmingham

BIRMINGHAM, ALA., November 24, 1913.

**Pig Iron.**—The basis of actual business in this district is from \$11 to \$11.50, there having been sales at \$11, \$11.25 and \$11.50. One of the most reliable of furnacemen said: "We have sold the past week several lots of iron. In no case was the basis below \$11 and in the majority of instances it was over that and as high as \$11.50." One concern reports sales of 3000 tons at \$11.25 to \$11.50, and another reports a sale of 1500 tons at \$11.50. A third reports sales of 500 tons at \$11.50, but admits that this quotation does not bring much business either for spot or 1914 delivery. All danger of an increase in the make of foundry pig iron seems to have been eliminated by the improved state of the steel order books of the leading interest. It is authoritatively announced that a run of the rail mill at the present rate of half to two-thirds capacity is assured for some time with every prospect of additional rail orders by the time those in hand are executed. This means that the blast furnaces now on basic iron will not be turned on foundry iron and that the present maximum of 14 foundry stacks will not be increased. Indeed, the furnace of the Republic Iron & Steel Company, which was blown in to make good its short supply of high grade iron, is to be blown out again as soon as that purpose is accomplished. The new Woodward stack cannot go in until April because of delay in delivery of the blowing engines. Up to last Saturday the leading pipe interest had not placed pig-iron orders in this district. The report of a sale of 20,000 tons under the market to pipe producers appears to have been without foundation. Dealers admit that the crucial test is close. They believe the 1914 buying movement must set in by December 15 and that then it will be decided whether the market is to go down or pick up. Little 1914 business has been done. As a rule the local furnace operators, while admitting present weakness, appear rather confident of the future. They also talk reduction of output rather than sell much under present prices, because there would be no profit at present cost of labor and raw materials. Consumers continue insistent in their demands for shipment. We quote, per gross ton, f.o.b. Birmingham district furnaces, as follows:

No. 1 foundry and soft	\$11.50 to \$12.00
No. 2 foundry and soft	11.00 to 11.50
No. 3 foundry	10.50 to 11.00
No. 4 foundry	10.25 to 10.75
Gray forge	10.00 to 10.50
Basic	11.00 to 11.25
Charcoal	23.50 to 24.00

**Cast-Iron Pipe.**—No change in prices is noted, but makers declare they are getting quotations more frequently. Government agents are in the district attending to shipments to the Canal Zone and, it is reported, also for the purpose of entering new Panama orders. We quote as follows, f.o.b. maker's yards: 4-in., \$22; 6-in., \$20, with \$1 added for gas pipe.

**Old Material.**—Dealers report better business, with a brisk demand for several grades and none neglected. Steel scrap is going especially well. We quote, per gross ton, f.o.b. dealers' yards nominal prices as follows:

Old iron axles (light)	\$15.00 to \$15.50
Old steel axles (light)	15.00 to 15.50
Old iron rails	12.50 to 13.50
No. 1 railroad wrought	12.00 to 12.50
No. 2 railroad wrought	10.00 to 10.50
No. 1 country wrought	9.50 to 10.00
No. 2 country wrought	8.50 to 9.00
No. 1 machinery cast	10.00 to 10.50
No. 1 steel scrap	10.50 to 11.00
Tram carwheels	10.50 to 11.00
Standard carwheels	12.00 to 12.50
Light cast and stove plate	8.50 to 9.00

**Coal and Coke.**—Steam coal has not recovered from the weakness characterizing the trade the past few weeks. In some instances a scarcity of cars has also hampered operations. An unusually mild fall has also had its effects. Smaller industrial plant operation has been a third item. Domestic coal is in good demand, with prices ruling higher than last year, due to improved quality at all mines on account of washing. Coke has shown no further weakness, but there is still a dearth of customers in some quarters. We quote, per net ton, f.o.b. oven as follows: Furnace coke, \$2.75 to \$3; foundry, \$3.25 to \$4.

## British Markets Still Sluggish

Rails and Joists Off—Iron May Go to Philadelphia—America Seeking Exports

(By Cable)

LONDON, ENGLAND, November 26, 1913.

In the main, conditions remain unaltered. There seems to be a chance that some Cleveland iron bought long ago is to be shipped to Philadelphia. General buying remains restrained but prices in many directions are probably near bottom.

Certain Alabama pig-iron makers and independent steel makers are looking after export business. The Standard Oil Company is still inquiring for tinplates. Stocks of pig iron in Connell's stores are 152,150 tons against 152,804 tons a week ago. We quote as follows:

Tin plates, coke 14 x 20, 112 sheets, 108 lb.; f.o.b. Wales, 12s. 9d. (\$3.10).

(The following prices are per ton of 2240 lb.):

Cleveland pig-iron warrants (Tuesday) 49s. 2d. (\$11.95) against 48s. 10d. (\$11.87), one week ago.

No. 3 Cleveland pig iron, makers' price, f.o.b. Middlesbrough, 49s. 6d. (\$12.03) against 49s. 3d. (\$11.97), one week ago.

Ferromanganese, £9 17s. 3d. (\$48).

Steel sheet bars (Welsh), delivered at works in Swansea Valley, £4 15s. (\$23.11).

Steel bars, export, f.o.b. Clyde, £6 5s. (\$30.48).

Steel joists, 15-in., export, f.o.b. Hull or Grimsby, £5 15s. (\$27.98), a decline of 2s. 6d. (61c.).

Steel ship plates, Scotch, delivered local yards, £6 17s. 6d. (\$33.46).

Steel black sheets, No. 28, export f.o.b. Liverpool, £9 (\$43.79).

Steel rails, export, f.o.b. works port, £6 5s. (\$30.41), a decline of 2s. 6d. (61c.).

(The following prices are per export ton of 1015 kilos, equivalent to 2237.669 lb.):

German sheet bars, f.o.b. Antwerp, 77s. (\$18.73).

German 2-in. billets, f.o.b. Antwerp, 80s. (\$19.46).

German basic steel bars, f.o.b. Antwerp, £4 11s. (\$22.13).

German joists, f.o.b. Antwerp, £5 5s. to £5 8s. (\$25.55 to \$26.28).

(By Mail)

**European Conditions Show Little or No Improvement—No Pig Iron Sale to Philadelphia**

LONDON, November 14, 1913.

The position of the iron and steel markets is not in the least improved, and the utmost that can be said in favor of the situation is that the time draws nearer when some improvement will be perceptible. It is of no use to disguise the fact that things are pretty bad in Europe and the scramble for work is still going on, with the dead certainty that the German Verband will have to reduce its price for sheet bars, to which it has stuck so tenaciously for many weary weeks. It is hopeless to hold out for 85s (\$20.69) a ton f.o.b. Antwerp, while the Belgians and French are accepting as low as 78s (\$18.98). Certainly business cannot be done at this figure today, but it was possible not so long ago, and even today 80s (\$19.46) bid firm would probably result in bookings, though there is a tendency to make out that the price is really higher than this. The Germans would now probably accept competitive terms, for they have done nothing of any importance for months in sheet bars though they have made fairly good prices for special quality billets—such as might be offered by your Alabama mills. Continental finished material is bad, though here, too, there is an inclination to raise prices a shilling or two, and it is a favorable feature that Japanese inquiries are more numerous and that buyers in Japan are now asking for deliveries well into the spring months.

As for pig iron, the Middlesbrough speculative element seems still to be living on rumors of Philadelphia pipe founders taking cargoes to help them out, but there really seems to be no reason whatever for Philadelphia to buy Cleveland material, and the probability is that the whole thing is sheer gossip, in which the wish is father to the thought. The stocks in public stores on the Tees continue to decrease, but nobody pays any attention to this feature, for it is recognized that any attempt to manipulate the market upward in the present condition of sentiment would be foredoomed to failure, and blast furnacemen find it a very

hard job to market their output. Furnaces on foundry iron are being stopped in most districts. I hear that a couple more in the Tees neighborhood are going out, and that probably others will follow, while in the hematite trade things are very bad. Probably 61s (\$14.85) would be accepted now for East Coast hematite, but buyers are shy of acting even at this rate, although a little more inquiry is said to have come forward from the Sheffield steel makers, who alone in the steel trade seem to have the prospect of fairly good times next year. This arises, of course, from the amount of government work which falls to their lot.

Finished steel is poor. An immense quantity is coming into the country, especially Scotland, from Germany and this is really hitting the Scotch makers pretty hard, but outside this area altogether the position is unsatisfactory in the extreme.

## German Conditions Slightly Better

Steel Bars and Wire Products Higher  
Record Output of Pig Iron in October

BERLIN, November 13, 1913.

The situation begins at last to look a little better. Steel bars, which had led the downward movement of the past eight months, are now showing a slightly firmer tendency. They have risen this month about 3 marks (71c.) a ton in the western and southwestern districts; and a similar advance in the wire market is also reported. These advances coincide with a rise of the export price of Belgian steel bars by one shilling (24c.) and iron bars by one to two shillings (24c. to 49c.) a ton at Antwerp.

### Pig-Iron Production Increased

The production of pig iron in October, contrary to expectations, broke all records. The total was 1,650,205 metric tons, which exceeds the September make by 71,000 tons, and that of October, 1912, by about 16,500 tons. In view of the fact that the blowing out of some furnaces for repairs had been reported, it was believed that the October production would show a further falling off. Notwithstanding the increased production, the stocks of iron at the furnaces increased but slightly. On October 31, they were 419,000 tons, as compared with 408,000 tons at the end of September.

Several days ago it was reported that German pig iron is now being offered in large quantities on the west coast of Scotland. This news, following so closely upon the sales in Belgium mentioned last week, is a further indication of the increasing overproduction of the German furnaces and of the necessity to find a foreign outlet. From the Silesian district comes news that the consumers of German pig iron across the Russian frontier are still calling urgently for shipments. That district also reports in general a brisker tendency in the buying demand.

### Syndicate Movements

The Steel Works Union has opened 1914 business in structural shapes for export at unchanged prices. Within a few days it will declare business in semi-finished steel and structural shapes open for the home market; it is expected that here, too, prices will remain unchanged. The Union's shipments in October reached 524,891 tons, comparing with 520,392 tons in September, and 540,586 in October, 1912. The orders of the Kontor for shipbuilding steel in October reached 35,000 tons. This was less than for September, in which month several extra large orders were placed.

The efforts to organize the trade in gas and boiler piping are continuing. An agreement has been entered into for holding prices till the end of the month, pending further work by the committee that has charge of the preparations for the organization. A general meeting is to be held in two weeks. The great Gelsenkirchen Company has recently taken an order from Argentina for 60,000 tons of cast-iron pipe for somewhat above \$1,000,000.

The Hasper Eisen und Stahlwerk is pushing work on its new open-hearth plant, consisting of three 50-ton furnaces. The plant, which will go into operation in January, is to run on direct blast-furnace metal, and it is expected that it will be able to make open-hearth steel as cheap as basic Bessemer.

Besides the news from the Belgian market already mentioned, it is telegraphed here that the plate export trade continues to weaken. The following prices are described as scarcely obtainable: Heavy plates, 101s. to 102s. (\$24.57 to \$24.82), and thin plates, 108s. to 110s. (\$26.28 to \$26.76).

## St. Louis

ST. LOUIS, Mo., November 24, 1913.

The waiting disposition has been somewhat accentuated and at the present moment it is expected that there will be no improvement until actual necessity compels buying.

**Pig Iron.**—For the existing conditions there has been a rather active inquiry for soft iron in No. 1, No. 2 and No. 3 grades. Purchases include one of 300 tons of No. 1; one of 200 tons of No. 2 soft and one of 300 tons of No. 3 soft; also two of 100 tons of No. 2 soft and one of 150 tons of No. 3 soft. All these have been for prompt shipment. In No. 2 foundry iron there has been quite a number of small purchases as well as in No. 3, but there has not been competition enough to determine the market's strength.

**Coke.**—Transactions have been in small lots of special brands for particular purposes, with some few sales for domestic use. Foundries for the most part are out of the market and are unwilling to make any contracts even at the present prices. In by-product coke the quotation is about \$4.40 to \$4.50 delivered in St. Louis.

**Finished Iron and Steel.**—New business does not exceed 50 per cent. of shipments, perhaps less. Salesmen are competing keenly for small orders and in consequence there is something of a ragged market. Nominally 1.35c. is the quotation on structural material, but there is little doubt that business in relatively small quantities could be placed at close to 1.30c. Fabricating shops continue busy but report comparatively little advance business on the books. Bars are in a little better shape than structural material, though this demand is not as sharp as previously. Plates are particularly weak. Light rails are moving a little to the coal mines, but practically none to the lumber districts. Track fastenings are quiet.

**Old Material.**—In the scrap market the conditions are, to say the least, no better than they have been. Consumers show no disposition to buy and dealers are taking only such material as is likely to give them a profit in the future. Second-hand rails, however, are in more than usually active request and prices are somewhat better, with few rails to be had. The railroads are indisposed to let their scrap go at present prices and there are therefore no lists coming out. Steel foundries and rolling mills are still declining wherever possible to take material. We quote dealers' prices f.o.b. St. Louis, as follows:

### Per Gross Ton.

Old iron rails	\$10.00 to \$10.50
Old steel rails, re-rolling	10.50 to 11.00
Old steel rails, less than 3 feet	9.00 to 9.50
Relaying rails, standard section, subject to inspection	23.00 to 24.00
Old earwheels	10.00 to 10.50
Heavy melting steel scrap	8.50 to 9.00
Shoveling steel	7.50 to 8.00
Frogs, switches and guards cut apart	8.00 to 8.50

### Per Net Ton.

Iron angle bars	\$8.50 to \$9.00
Steel angle bars	7.00 to 7.50
Iron car axles	15.50 to 16.00
Steel car axles	10.00 to 10.50
Wrought arch bars and transoms	10.00 to 10.50
No. 1 railroad wrought	7.50 to 8.00
No. 2 railroad wrought	7.00 to 7.50
Railroad springs	6.75 to 7.25
Steel couplers and knuckles	6.75 to 7.25
Locomotive tires, smooth	8.50 to 9.00
No. 1 dealers' forge	6.00 to 6.50
Mixed borings	2.00 to 2.50
No. 1 busheling	6.00 to 6.50
No. 1 boilers, cut to sheets and rings	3.00 to 3.50
No. 1 cast scrap	8.00 to 8.50
Stove plate and light cast scrap	6.00 to 6.50
Railroad malleable	6.50 to 7.00
Agricultural malleable	6.00 to 6.50
Pipes and flues	4.00 to 4.50
Railroad sheet and tank scrap	3.00 to 3.50
Railroad grate bars	5.50 to 6.00
Machine shop turnings	3.00 to 3.50
Bundled sheet scrap	3.50 to 4.00

## Boston

BOSTON, MASS., November 23, 1913.

**Old Material.**—The dealers are quoting lower prices. The mills have had the upper hand for several months and the condition is now more highly accentuated. The producers, large distributors and collectors of scrap are compelled to accept the more unfavorable situation. Prices are by no means standard, the figures now named being to a large extent nominal. The quotations given below are based on prices offered by the large dealers

to the producers and to the small dealers and collectors, per gross ton, carload lots, f.o.b. Boston and other New England points which take Boston rates from eastern Pennsylvania points. In comparison with Philadelphia prices the differential for freight of \$2.30 a ton is included. Mill prices are approximately 50c. a ton more than dealers' prices.

Heavy melting steel	\$7.75 to \$8.00
Low phosphorus steel	13.75 to 14.75
Old steel axles	13.25 to 13.75
Old iron axles	21.25 to 21.75
Mixed shafting	12.25 to 12.50
No. 1 wrought and soft steel	9.00 to 9.25
Skeleton (bundled)	6.00 to 6.50
Wrought-iron pipe	6.50 to 7.00
Cotton ties (bundled)	7.00 to 7.25
No. 2 light	3.75 to 4.25
Wrought turnings	4.50 to 5.00
Cast borings	4.50 to 5.00
Machinery, cast	11.25 to 11.50
Malleable	8.00 to 8.25
Stove plate	7.75 to 8.00
Grate bars	6.25 to 6.50
Cast-iron carwheels	11.00 to 11.25

## Buffalo

BUFFALO, N. Y., November 25, 1913.

**Pig Iron.**—Sales have aggregated approximately the same as for the previous week, about 8000 tons. A considerable portion of this total was secured by accepting a concession in prices. The Lackawanna Steel Company has closed down more than 50 per cent. of its furnace capacity. Foundries in tributary territory, although now running with nearly full forces of men, rushing work called for on old contracts, are approaching a period of much leaner orders and may be confronted with the necessity for curtailing production within the next three weeks. Furnaces are still shipping heavily on old contracts, but the end of this activity is in sight. In the judgment of older members of the trade there has not been such a slack business outlook in the past 30 years. The range of prices is practically confined between \$13 and \$13.75, with no hard and fast price limit between the low and the high grades. The price schedule given below, although not applicable to all business that is running, approximates as closely as possible the average views of the different producers of the district covering remainder of year and first quarter 1914 deliveries, f.o.b. furnace:

No. 1 foundry	\$13.75 to \$14.00
No. 2 X foundry	13.50 to 13.75
No. 2 plain	13.25 to 13.50
No. 3 foundry	13.25
Gray forge	13.00 to 13.25
Malleable	13.50 to 14.00
Basic	14.00 to 14.50
Charcoal	15.50 to 16.50
Charcoal, special grades and analyses	17.00 to 19.50

**Old Material.**—Business was of very small proportions and at low figures and limited principally to two or three commodities, turnings and borings being the lines in which the most movement was noted. We quote as follows per gross ton, f.o.b. Buffalo, the prices named being almost entirely nominal:

Heavy melting steel	\$9.75 to \$10.50
Boiler plate, sheared	11.50 to 12.00
Bundled sheet scrap	6.00 to 6.50
No. 1 busheling scrap	9.00 to 9.50
No. 2 busheling scrap	6.00 to 6.50
Low phosphorus steel scrap	16.50 to 17.00
Iron rails	15.00 to 15.50
No. 1 railroad wrought	12.00 to 12.50
No. 1 railroad and machinery cast scrap	12.00 to 12.50
Steel axles	17.00 to 17.50
Iron axles	22.50 to 23.00
Car wheels	11.75 to 12.25
Railroad malleable	11.00 to 11.50
Locomotive grate bars	9.50 to 10.00
Stove plate (net ton)	9.75 to 10.00
Wrought pipe	8.50 to 9.00
Machine shop turnings	5.00 to 5.50
Heavy steel axle turnings	8.00 to 8.75
Clean cast borings	5.50 to 6.00

**Finished Iron and Steel.**—About the only purchasing is to cover actual necessities. Stocks are being further depleted, however. The tendency of most buyers is to defer buying until after the first of the year. The conditions are regarded as pointing to a good buying movement at that time for actual requirements. There has not been sufficient inquiry to test prices and they remain nominally as reported last week: 1.30c. base for bars, shapes and plates, the latter being weakest, with some business moving in this commodity at 1.25c. and some structural shapes selling at 1.35c. Considerable closing of business in tin plates is noted. In fabricated structural material, the volume of new business reported is smaller than for a number of weeks and prices are somewhat softer. Bids were opened for subway work for grade crossing elimination at the

New York Central Railroad Belt Line and the Erie Railroad crossings, Military Road, involving a considerable tonnage of structural steel and about 200 tons of reinforced bars. The Lackawanna Bridge Company, Buffalo, has 1000 tons for a bank building, Wilmington, N. C. Lupfer & Renwick, contracting engineers, Buffalo, have contracts for bridges, one over the Erie Canal at Utica and the other over the Black River Canal, Boonville, N. Y., each taking a small tonnage. Bids opened here to-day show the Van Dorn Iron Works, Cleveland, to be low bidder for the steel cell construction for the Erie County Jail at \$77,500.

## New York

NEW YORK, November 26, 1913.

**Pig Iron.**—The buying of round lots of foundry iron by Connecticut interests two weeks ago has not proved a stimulus to the general market. The situation in finished steel seems to have reacted on pig iron buying, affecting not only prices but volume of business. Two purchases of about 500 tons each by New Jersey machinery interests are reported for the past week and there has been some 200-ton and 300-ton business; but otherwise the market is flat. That many foundries have not yet bought any iron for shipment after January 1 is well known, but measured by the amount of interest in such deliveries, 1914 appears to be a long way off. Foundry operations have shrunk somewhat in the past month, but the shrinkage is not marked and it has had no great effect as yet on shipments from furnaces. New Jersey foundries which can take water delivery have had quotations recently below \$15. delivered, for No. 2 plain. The Buffalo market shows some variations, but \$13.50 for No. 2 X is not an unusual quotation on iron going East. The strike at the Schenectady works of the General Electric Company has led to some suspension of shipments, but the shutdown is not expected to be of long duration. Little is heard of Virginia iron in New England or nearby markets. The usual quotation is \$13 at furnace for No. 2 X, but this is scarcely minimum. We quote Northern iron for tidewater delivery as follows: No. 1 foundry, \$15.50 to \$15.75; No. 2 X, \$15.25 to \$15.50; No. 2 plain, \$15. Southern iron is quoted at \$15.25 to \$15.75 for No. 1 foundry and \$14.75 to \$15.25 for No. 2.

**Finished Iron and Steel.**—The view is expressed that the weakness in prices is really a strong feature; were prices held at the higher prices recently prevailing when there was little business, it could be charged that sellers could discern no waiting buying movement. Instead the approaching needs of industry and of railroads are bound to develop shortly into business, it is held, and the widely admitted low supplies of stocks give justification for the optimistic views, and accordingly recent price revisions indicate a baiting after orders. Less is heard of possibilities of importations having much of an effect on the price situation; rather is the information that foreign mills, on making inquiries, are advised not to test the American market, at least at this time. Another interesting development is noted, namely, that some bar-iron contracts have been closed at to-day's better prices for 6 mo., with the stipulation that with a betterment in prices, the basis of the contracts may be revised in 3 mo. It remains that there is a hunt for business and building contractors are making surprisingly low bids. The largest structural award of the week was 27,000 tons to Post & McCord, for the New Utrecht avenue portion of the New York Subways, Brooklyn. It is believed that some 10,000 tons for two other sections of the subways is also to be fabricated by the American Bridge Company. About the only other awards of size were for railroad bridge work, about 200 tons at Olneyville, R. I., for the New Haven, 300 tons for the Philadelphia & Reading and 200 tons for the Pennsylvania, going to Lewis F. Shoemaker & Co. Steel bars still continue strong in contrast with shapes and plates, for while 1.25c., Pittsburgh, is admitted as the minimum for shapes and plates, only occasional shading of 1.30c. for bars is noted, and this apparently only in New England. We quote mill shipments of bars at 1.30c., Pittsburgh, or 1.40c., New York, and steel plates and plain structural material at 1.25c. to 1.30c., Pittsburgh, though a really large offering would probably bring 1.20c., Pittsburgh. We quote for refined iron 1.30c. to 1.40c., New York. Iron and steel bars from store are 1.90c. to 1.95c. and shapes and plates 1.95c. to 2c.

**Cast-Iron Pipe.**—Competition is sharp on public lettings and low prices are being made. New London, Conn., awarded about 300 tons on Monday and the successful bidder went below previous prices. While

private buyers are still sounding the market for spring delivery, they are slow to close, apparently waiting for the most favorable opportunity to place contracts. Carload lots of 6 in. are quoted at \$23 to \$24 per net ton, tidewater.

**Ferroalloya.**—Inquiries and sales are confined to small lots, with actual needs only being attended to. Quotations remain the same as last week, with English ferromanganese obtainable for \$50, Baltimore, and ferrosilicon for \$75. Pittsburgh, for carloads: \$74 for 100 tons, and \$73 for 600 tons or over.

**Old Material.**—The market continues exceedingly quiet. The only transactions reported are in small lots. In some classes of material practically nothing has been done. Dealers' quotations are as follows, per gross ton, New York:

Old girder and T rails for melting.....	\$7.75 to \$8.25
Heavy melting steel scrap .....	7.75 to 8.25
Relaying rails .....	20.50 to 21.00
Rerolling rails .....	10.50 to 11.00
Iron car axles .....	20.00 to 21.00
Steel car axles .....	13.50 to 14.00
No. 1 railroad wrought .....	10.75 to 11.25
Wrought iron track scrap .....	9.75 to 10.25
No. 1 yard wrought, long .....	9.25 to 9.75
No. 1 yard wrought, short .....	8.25 to 8.75
Light iron .....	3.00 to 3.50
Cast borings .....	4.50 to 5.00
Wrought turnings .....	4.25 to 4.75
Wrought pipe .....	7.00 to 7.50
Carwheels .....	11.00 to 11.50
No. 1 heavy cast, broken up .....	11.00 to 11.50
Stove plate .....	7.25 to 8.25
Locomotive grate bars .....	7.25 to 7.75
Malleable cast .....	8.00 to 8.50

## Metal Market

NEW YORK, November 26, 1913.

### The Week's Prices

Cents Per Pound for Early Delivery						
		Copper, New York		Lead		Spelter
Nov.	Lake.	Electro-	Tin,	New	St.	New
20.	16.00	15.12½	39.80	4.30	4.15	5.25
21.	16.00	15.00	39.75	4.30	4.15	5.25
22.	16.00	15.00	.....	4.30	4.15	5.25
24.	16.00	14.87½	39.35	4.30	4.15	5.25
25.	15.75	14.75	39.30	4.30	4.15	5.25
26.	15.50	14.75	39.50	4.30	4.15	5.10

Copper is stagnant and the market is lower. Business in tin is lacking and the metal has declined again. Lead is offered at concessions by independents, but the market is quiet. Spelter is off a few points, but dullness continues. Antimony is a trifle weaker.

### New York

**Copper.**—There has been no business of importance since the last report and the market is one wherein prices are almost entirely nominal. Electrolytic has been offered to Europe at 14.75c., c.i.f., and is quoted here to-day at 14.75c. to 15c., cash. At the latter figure, especially, offerings have been freely made. Lake is nominal at 15.50c., though when a new price is announced by producers it is likely to be on a lower level. On Monday last, a carload of Lake was sold at 16c. Many of the big brass and copper mills in the Naugatuck Valley are running on shortened time, some of them five days and some only four days. It was expected that by this time many consumers would be forced to buy for December, but it is understood that this may not be necessary for the reason that diminished melting has enabled them to carry metal over from November and with what little they have bought, will have enough to carry them to the end of the year. On the other hand, it is felt by some that trade cannot have fallen off to such an extent as might be assumed from the stagnant market. These observers hold that consumers' stocks must be very low and that when the turn comes the recovery will be rapid and substantial. Spot copper is quoted in London to-day at £67 5s. and futures at £66 5s. Exports this month total 23,425 tons.

**Pig Tin.**—Conditions are now reversed from what they were a few days ago. The light demand caused the movement which was started to gain control of November tin to be abandoned, as a consequence of which the market is easier again and down to the import cost. The light buying failed to support the operations of the dealers in whose hands a great deal of tin was concentrated and who still hold it. There is now actually available for November consumption 4100 tons. The highest estimate of the amount that would be delivered in the course of the month is 3300 tons, while some estimates run below 3000 tons, so in any event there is certain to be ample stock on hand on Decem-

ber 1, contrary to recent expectations. A factor in the slow state of the market is that tin plate manufacturers, while they have booked many orders for their product, have not bought tin to cover the plates contracted for. The New York quotation to-day is 39.50c. The quotations in London to-day are £180 for spot and £181 5s. for futures. Arrivals this month total 2467 tons and there is afloat 1785 tons.

**Lead.**—The market is weak at 4.15c., St. Louis, and 4.30c., New York, which is under the price of the largest interest. Independent producers who are making the concession are getting what light routine business there is and therefore it is expected that the situation will result in a cut by the American Smelting & Refining Company before long.

**Selter.**—Consumption has fallen off to a considerable degree and business is correspondingly light, but on the whole selter has held up fairly well as regards price. It is quoted at 5.25c., New York, and 5.10c., St. Louis.

**Antimony.**—In a dull market there have been reductions in prices. Quotations are 7.12½c. to 7.25c. for Hallett's, 7.40c. to 7.50c. for Cookson's and 6.25c. to 6.50c. for Chinese and Hungarian grades.

**Old Metals.**—Prices have continued to decline. Dealers are quoting to sell as follows:

	Cents per lb.
Copper, heavy and crucible	14.50 to 14.75
Copper, heavy and wire	14.00 to 14.25
Copper, light and bottoms	12.75 to 13.00
Brass, heavy	9.00 to 9.25
Brass, light	7.75 to 8.00
Heavy machine composition	12.75 to 13.00
Clean brass turnings	8.75 to 9.00
Composition turnings	11.25 to 11.50
Lead, heavy	4.10
Lead, tea	3.85
Zinc, scrap	4.15

#### Chicago

**NOVEMBER 24.**—The market for non-ferrous metals has slumped, apparently in sympathy with the general depression. Copper quotations are lower by 3/4c. per lb. and concessions on lead by outside dealers are as much as \$2 per ton. Scrap metals likewise have felt the market heaviness. We quote as follows: Casting copper, 15.50c.; Lake copper, 15.75c., for prompt shipment; small lots, 3/4c. to 1/2c. higher; pig tin, carloads, 40c.; small lots, 42c.; lead, desilverized, 4.20c. to 4.30c. and corroding, 4.45c. to 4.60c. for 50-ton lots; in carloads, 2½c. per 100 lb. higher; selter, 5.20c.; Cookson's antimony, 9.50c.; other grades, 8c.; sheet zinc, \$7.50, f.o.b. La Salle or Peru, Ill., less 8 per cent. discount in carloads of 600-lb. sacks. On old metals we quote buying prices for less than carload lots as follows: Copper wire, crucible shapes, 13c.; copper bottoms, 11.50c.; copper clips, 12c.; red brass, 11.50c.; yellow brass, 8.50c.; lead pipe, 3.75c.; zinc, 3.75c.; pewter, No. 1, 24c.; tin foil, 31c.; block tin pipe, 33c.

#### St. Louis

**NOVEMBER 24.**—Metals have been lower, particularly the Missouri product, and there has been a reduction in price, though not a sharp one. Some sales have been made at the lower figures, but no large aggregate changed hands. Lead is quotable at 4.15c. to 4.17½c.; selter, 5.10c. to 5.15c.; electrolytic copper, 15.22½c. to 15.47½c.; Lake copper, nominal, 15.35c. to 15.60c.; tin, 40.20c. to 40.60c.; Cookson's antimony, 7.85c. to 8.35c. In the Joplin ore market prices showed a weaker tendency than a week ago. The basis range for 60 per cent. zinc blende was \$40 to \$43 per ton, with the top settlement for the choicest \$46. Calamine, 40 per cent., brought \$20 to \$22, with the top at about \$25. Lead ore was quiet at \$52 for 80 per cent. On miscellaneous scrap metals we quote as follows: Light brass, 5.50c.; heavy yellow brass, 8.50c.; heavy red brass and light copper, 10.50c.; heavy copper and copper wire, 11.50c.; zinc, 2.75c.; lead, 3c.; pewter, 24c.; tinfoil, 30c.; tea lead, 2.75c.

W. & B. Douglas, Middletown, Conn., have brought out a new type of horizontal pump, in which the cylinder is lined with brass and the valve disk is made of solid rubber and seats on bronze grids. The pump is belt driven, the power being transmitted through a set of gears with a ratio of 5 to 1 to a crankshaft. The air chamber is independent of the piping and the casting of the shaft bearings is integral with the cylinder. Four sizes of pump in all are built, having capacities ranging from 600 to 2400 gal. per hr. at a speed of 50 r.p.m.

## Iron and Industrial Stocks

NEW YORK, November 26, 1913.

The New York Stock Exchange is now passing through its dullest period in about 15 years. The speculative spirit has almost disappeared. In some stocks there have been no transactions for several successive days. Under these circumstances it is quite remarkable that values have been sustained. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chalm., com...	7 1/2 - 8 1/2	Pressed Steel, pref.	95 - 97
Allis-Chalm., pref...	40 - 40 1/2	Railway Spring, com...	24
Am. Can. com...	27 1/2 - 29 1/2	Republic, com...	18 1/2 - 20
Am. Can. pref...	90 1/2 - 93 1/2	Republic, pref...	79 - 80
Am. Car & Fdy. com.	43 1/2 - 43 1/2	Rumely Co., com...	14 - 16
Am. Car & Fdy. pref...	112	Rumely Co., pref...	34 - 39 1/2
Am. Loco. com...	29 1/2 - 29 1/2	U. S. Steel, com...	54 1/2 - 56 1/2
Am. Loco. pref...	97 - 98	U. S. Steel, pref...	104 1/2 - 105 1/2
Am. Steel Foundries	25 - 26	V. I. C. & Coke...	41
Bald. Loco. com...	39	Westinghouse Elec.	63 1/2 - 65
Beth. Steel, com...	29 - 30	Am. Ship, com...	29 - 29 1/2
Beth. Steel, pref...	69 - 69 1/2	Am. Ship, pref...	84
Case (J. I.), pref...	95	Chic. Pneu. Tool...	51 1/2 - 52
Colorado Fuel ...	26 1/2 - 27 1/2	Cambria Steel...	47 - 47 1/2
General Electric ...	137 1/2 - 140 1/2	Lake Sup. Corp...	22
Gr. N. Ore Cert...	32 - 32 1/2	Pa. Steel, pref...	64
Int. Harv., com...	102 - 103	Warwick...	10 1/2
Int. Harv., Corp...	101 1/2 - 101 1/2	Crucible Steel, com...	15 - 15 1/2
Int. Pump, com...	4 1/2 - 5	Crucible Steel, pref...	89 1/2 - 90 1/2
Int. Pump, pref...	18	Harb. Wk. Rf., com...	47 1/2 - 48
Nat. En. & St., com.	10 1/2 - 10 1/2	La Belle Iron, com...	40
Nat. En. & St., pref...	35	La Belle Iron, pref...	118 1/2
Pittsburgh Steel, pref...	90		

#### Dividends Declared

The New York Air Brake Company, regular quarterly, 1 1/2 per cent., payable December 22.

The Republic Iron & Steel Company, regular quarterly, 1 1/4 per cent. on the preferred stock, payable January 2.

The National Lead Company, regular quarterly, 3/4 of 1 per cent. on the common stock, payable December 31.

## Chicago Machinery Market

The following machinery market news was received from our Chicago representative too late for insertion in its proper connection:

The only matter of unusual interest to machine tool builders in this market remaining unclosed is the Board of Education's list of machines for the several Chicago high schools. This list of tools includes the following:

- One universal milling machine, motor driven.
- One 15-in. shaper, motor driven.
- Sixteen 14 in. x 6-ft. belt-driven engine lathes.
- One 18-in. x 8-ft. belt-driven engine lathe.
- One high power heavy pattern universal milling machine.
- One 16-in. belt-driven shaper.
- One 26-in. x 26-in. x 6-ft. motor-driven planer.
- One 11-in. x 4-in. automatic lathe.
- One 16-in. sensitive drill.
- One 30-in. radial drill.
- One 14-in. x 8-ft. high-speed lathe, motor driven.
- One 25 x 8 x 18-in. heavy type universal miller.
- One motor-driven double-end dry grinder, with 12-in. wheels.
- One 20-in. belt driven tool grinder.
- One 18-in. belt-driven disc grinder.
- Thirty machinists' vises.

The list also includes belting, shafting, and a number of small miscellaneous tools. The general status of the market remains unchanged.

The net surplus of idle cars, as shown by the Bulletin of the American Railway Association, was 22,652 on November 15, which compares with a net shortage of 1842 cars on November 1. The statistics are fortnightly, and the nearest date for comparison in 1912 is November 21, when there was a net shortage of 51,112 freight cars. The falling off in the demand for box cars in the Southern, Middle, West and Northwest States, noted in the report for November 1, continued in the next two weeks.

The Seattle, Wash., members of the United Metal Trades Association of the Pacific coast held a "get-together" meeting and banquet, participated in by the proprietors and foremen of the different plants, Saturday evening, November 22. The program covered the work of the foremen's association, the relations of employers and foremen, safety campaigns, and a report on the machinery and foundry equipment exhibit in connection with the foundrymen's convention at Chicago in October.

## Manufacturers and the Kahn Law

### The Menace of Its Provisions Pointed Out in Detail—Suggested Amendment

The Kahn law, effective September 18, 1913, which was designed to protect foreign exhibitors at the Panama-Pacific Exposition, but in reality will operate detrimentally to the interests of American manufacturers, was one of the subjects discussed at the convention held at the Hotel Astor, New York, November 21, under the auspices of the National Registration League. One of the matters considered was a report of the committee on laws and rules of the Patent Law Association of Washington, in which the possible results of the Kahn law are discussed. Readers of *The Iron Age* have already been made familiar with the provisions of the law in an editorial headed "A Menacing Patent Law," which appeared in our issue of November 6. Some extracts from the report of the Patent Law Association committee are given below:

"This law in effect grants a patent trademark, copyright, etc., to every exhibitor who holds a foreign patent, trademark, copyright, etc., from the time his goods are dumped on the Exposition grounds to at least December 4, 1918. This protection is granted without application, without the production of his foreign patent, trademark, etc., without examination, without fee, without publication or notice of any kind to the public. He is not even required to obtain the certificate provided for in section 2 of the act, which merely says that he 'may' get one if he chooses. The penalty for invading this right is far more severe than for infringement of a regular United States patent, because it includes fine or imprisonment or both.

"This, we believe to be the most dangerous, ill-considered and inexcusable law which has ever been enacted in relation to patent, design, trademark, and copyright property. It grants protection to inventions which may be as old as the hills; or which may have been in public use for more than two years; or on which patents have been refused by our Patent Office; or which may have been patented and dedicated to the public; or on which a United States patentee holds a patent still in force. It may create a right as of a patent for an invention upon what is merely the subject of a patent of importation in a foreign country.

"It creates property in designs or articles of manufacture without reference to invention or novelty and may include what has long been in prior use in this country or what has been before patented or described here or elsewhere, or what is not patentable in this country. It creates copyright property without reference to novelty or original authorship and may cover things long before known or used, or things which are public property or even things previously copyrighted. It gives trademark rights to one who may have pirated the well-known mark of a domestic manufacturer.

"The most extensively used and valuable American trademarks may be registered in many foreign countries by citizens of those countries and the foreign registrants can maintain their rights to such trademarks, in those countries irrespective of the rights of the American proprietors. The exhibition of goods by such foreign registrants under such trademarks would give them a right to bring suit to prevent American owners of the trademarks from continuing their use, with all the consequent embarrassment and annoyance resulting from such litigation, and so far as the act is concerned there is no justification for the belief that such foreign registrants could not maintain such suits, and enforce their claims and all the penalties provided in the act.

"To receive the extraordinary protection of this law the articles sent for exhibition need not even be taken out of the boxes until at some indeterminate time, provided only they are at some time 'exhibited,' say the day before the exposition closes. No notice of claim of ownership is required by the law; in fact, American citizens are required by the law to take notice of all pertinent foreign patents and registrations throughout the world. The exhibitor is permitted, if he chooses, to obtain a certificate, but he is not required to do so, nor is he limited to the measure of the rights indicated by the certificate.

"Under our general laws foreigners have the same facilities as our citizens to obtain patents for inventions, patents for designs, copyrights, and trademark protection.

There is no need for these new additional rights. The new law makes effective within the United States without the slightest reference to our laws many of the provisions of the laws of all foreign countries concerning patents, trademarks, etc. This necessarily involves many complications in the interpretation of these foreign laws.

"The act provides for no defenses against suits on such patents. The only question which could be put in issue would be the question of infringement. If found guilty, the infringer must suffer the penalty without any possibility of escape. The only exception is that if his infringement was innocent and unintentional he cannot be fined or imprisoned. As the effect of the act would be to adopt as the United States patent the foreign patent which might have no claim at all, the ordinary rules concerning infringement in our courts would not be available.

"The law is not limited to foreign exhibitors. It protects the 'proprietors' of foreign patents, trademarks, etc. Anybody in the United States who holds a foreign patent or registration may exhibit at the exposition and thereby secure absolute protection and the right to sue for infringement during four or five years, even on a device or trademark for which our Patent Office has refused protection. In Germany, for example, 'gebrauchsmuster' or petty patents are granted without examination upon all sorts of trivial things too unimportant or obvious to secure the protection of a regular patent. Yet the Kahn law gives the holder of a petty patent the same despotic rights as though he held a 'D. R.' patent obtained from the German Government after a rigid examination.

"The law would enable an unscrupulous person here or abroad merely to patent or register abroad in some country articles in common use by rivals in trade, exhibit them as required by the act and tie up the whole trade by suits under this law which does not require any proof of novelty, originality or actual use in trade. Such blackmailing patents or registrations might be secured even after the opening of the exposition, covering goods placed on exhibition by domestic manufacturers.

"It was passed without being submitted to any representative of American inventors, manufacturers or traders, or their legal advisers. It never was presented to the Patent Committee of either House of Congress. It was alleged to have the support of the late Commissioner of Patents, whereas, a few weeks before this statement was made, he was on record in a letter condemning the bill essentially upon the grounds herein indicated. It was said to be necessary to enact legislation which would protect the foreign exhibitor from piracy. To do this the law permits the piracy of the inventions, designs, trademarks and business of our citizens, protects the pirate and penalizes his victim.

"This Kahn law, if allowed to stand, will probably injure the Panama-Pacific Exposition. United States manufacturers will hesitate to send their goods to the Exposition for inspection by 'proprietors' of unknown foreign patents, if they thereby run the risk of suit for infringement, either rightly or wrongly, especially when they do not have even a chance of making any kind of a defense to such a suit. The present Commissioner of Patents has suggested that the law be amended to eliminate therefrom all mention of patents and trademarks."

In conclusion the report asks manufacturers to write to Senators and Representatives urging the necessity of revising the Kahn law in the way suggested by the Commissioner of Patents.

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The Keystone furnace of the Reading Iron Company, Reading, Pa., is to be blown in this week. Many improvements have been made, with a view of handling raw materials and product more conveniently. One of the new features is a new concrete trestle from which ore and coke will be dumped. Electricity will be used largely in the handling of the machinery connected with the operation of the furnace, which will now have a capacity of about 2,400 tons of pig iron per week.

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The Steel Improvement Company, Windsor avenue and Cleveland & Pittsburgh Railroad, Cleveland, Ohio, advises that it will not suspend operations while installing its large furnace and other equipment.

### An Open-Hearth Production Record

A new record for a month's production was made in October by two stationary open-hearth furnaces, Nos. 5 and 6, of the Youngstown Sheet & Tube Company, Youngstown, Ohio. The tonnage produced and the number of turns operated in the month by each of this company's six furnaces are tabulated below:

Furnace	Turns operated	Gross tons of ingots produced
No. 1. Pipe cooled ports	49	5,030.5
No. 2. Pipe cooled ports	34	2,944
No. 3. Pipe cooled ports	57	5,397
No. 4. Pipe cooled ports	55	4,972
No. 5. Blair ports	58	6,090.9
No. 6. Blair ports	58	6,213.8
Total	30,648.2	

No hot metal was available, the entire product being made from cold pig and scrap, and all the steel produced was dead soft steel. Reference is made in this connection to the fact that a previous record was made by No. 1 furnace at the Lorain works of the National Tube Company, also equipped with Blair ports. It produced 6,078 gross tons of ingots in the month of October, 1911, while the whole plant of six furnaces produced 31,459 tons of ingots. This record was accomplished with mixer metal.

### The Johns-Manville Cleveland Branch

The Cleveland branch of the H. W. Johns-Manville Company has recently been obliged to provide larger quarters for several of its subsidiary offices. The Columbus office and contract department are now located on the ground floor of the new seven-story fireproof Peters Power Building, 45 West Long street, with large warehouse facilities half a block distant. The Toledo office and warehouse have been moved to 213 Water street. Other Cleveland branch sub-offices are located in Akron, 717 Second National Bank Building; Dayton, 259 Fourth Street Arcade; and Youngstown, 502 Stambaugh Building. Resident representatives are stationed at Lima, Massillon, Greenville and other points in Ohio, also at Huntington and Parkersburg, W. Va., their work being supplemented by a large corps of traveling men. Last, but not least, the Cleveland branch has just closed a long-term lease for another and larger warehouse on Front street which, when remodeled, will give the branch larger and better storage and shipping facilities than ever.

Last week the annual convention of the sales agents of the Jones & Laughlin Steel Company was held in the general offices in Pittsburgh, with representatives present from all over the country. Business discussions occupied the time during the day, while entertainment was provided by the company in the evenings. The sessions closed with a dinner at one of the leading clubs in Pittsburgh.

An office is to be established in Philadelphia by A. R. Brunker & Co. to sell steel castings and other products. It is to be in charge of Clarence Toland and Thomas Rodman. The firm has been appointed sole agents for the Seaboard Steel Casting Company, Chester, Pa. A. R. Brunker is assistant to the president of the Liquid Carbonic Company, Chicago, and was formerly general sales agent of the American Steel Foundries.

The Acklin Stamping Company, Toledo, Ohio, despite the shrinkage in the automobile trade, reports an encouraging outlook. The lull in the automobile industry is regarded as temporary, manufacturers being of the opinion that it will not be of long duration and that the output in 1914 will be larger than in 1913. The general stamping business is good.

The Detroit Shipbuilding Company has taken an order from the George Hall Coal Company, Ogdensburg, N. Y., for a steamer for 1914 delivery which will be operated in the coal trade on Lake Ontario. The boat will be 244 ft. keel, 43 ft. beam and 21 ft. deep, and will be equipped with triple expansion engines and Scotch boilers.

### French Production in the First Half Year

The Comité des Forges de France gives the following comparative figures covering the production of steel for the first six months of this and last year in metric tons:

	First six months 1913	1912
Ingots	36,786	30,898
Acid converter	1,494,826	1,318,362
Basic converter	685,988	613,058
Open hearth	11,711	10,997
Crucible	9,246	7,920
Electric		
Total	2,238,557	1,981,235

The comparative figures for pig iron, including ferromanganese and spiegeleisen, are 2,576,435 tons for the first six months of 1913 and 2,345,003 tons for the same period last year.

**The General Electric Company's Strike.**—Because of the failure of the officials of the General Electric Company at Schenectady, N. Y., to reinstate two union leaders who were laid off along with a large number of others, a strike was ordered by the officers of 25 unions, which resulted in a walk-out of about 14,000 union men and women on Tuesday. The unions claim that the company has adopted a policy of crushing unionism, whereas the company states that retrenchment is its only aim. The questions of hours and wages are not involved. Preparations for a struggle have been temporarily halted because the movement is meeting with the decided opposition of the American Federation of Labor. There are 17,000 employees, including 1800 girls.

The latest statistics of the United States Steel Corporation's profit-sharing plan, which has been in operation for a decade or more, show that over 40,000 of its employees hold stock in the company. Their holdings of preferred stock comprise 313,318 shares, for which they paid an average of \$98.32. The present market value is about \$33,000,000. The common was first offered in 1909, and of it the men have purchased 100,065 shares at an average of \$62.75. The total present value of stock of both classes bought by the employees approximates \$38,500,000.

Exports of merchandise from the United States in the month of October attained the total value of \$271,588,726. This is a record breaker. The value of the imports in the same month was \$132,893,960. The excess of exports was thus \$138,694,766. These figures are taken from the statement just published by the Division of Statistics of the Bureau of Foreign and Domestic Commerce of the Department of Commerce.

The Rowe Motor Mfg. Company, Coatesville, Pa., established about four years ago and engaged in the manufacture of motor trucks, is making arrangements to move its plant to Downingtown, Pa., about seven miles from its original location. Samuel D. Rowe, president of the company, announces that its business has outgrown its present facilities. Plans have been drawn for a large factory building at Downingtown.

The Sullivan Machinery Company, Peoples Gas Building, Chicago, announces the removal of its El Paso branch office from 506 San Francisco street to rooms 511 and 512 Mills Building, El Paso, Texas. The old quarters on San Francisco street will be maintained as enlarged warerooms, in which compressors, drills and their parts are carried in stock. The local manager is Don M. Sutor.

The Wilkoff Iron & Steel Company, Youngstown, Ohio, has purchased a six-acre site on which it will erect a steel building, 100 x 250 ft., to be used for the manufacture of reinforced concrete bars. The remainder of the site will be used for a scrap-iron yard and will be equipped with shears, cranes and other machinery.

The Trumbull Steel Company, Warren, Ohio, will install two additional sets of cold rolls and will add another furnace to its annealing department. At present the plant has four separate stands and three double stands of cold rolls and eight double coal burning furnaces.

## Personal

Judge Elbert H. Gary, chairman United States Steel Corporation, will be the principal speaker at a banquet to be given in Cincinnati, Ohio, by the National Housing Association on the evening of December 5.

Dr. Richard Amberg, East Orange, N. J.; Alfred E. Greene, American Electric Smelting & Engineering Company, Chicago, and Dr. John A. Mathews, manager Halcomb Steel Company, Syracuse, N. Y., have been appointed the committee on electrometallurgy of iron and steel of the American Electrochemical Society. Frederick M. Becket, Electrometallurgical Company of America, Niagara Falls, N. Y., Dr. Erick A. Beck, Goldschmidt Thermit Company, New York, and Napoleon Petinot, electrometallurgical engineer, Niagara Falls, N. Y., constitute the committee on ferroalloys.

Julian Kennedy, consulting engineer, Pittsburgh, will address the Up-to-Date Club, of Youngstown, Ohio, on Friday, November 28, on "Municipal Efficiency."

Charles M. Schwab, president Bethlehem Steel Company, was present at the Carnegie Day exercises in the Carnegie Institute of Technology at Pittsburgh on Tuesday, November 25, and made an address on "Andrew Carnegie."

James A. Campbell, president Youngstown Sheet & Tube Company, and other officials of that concern, have returned from a trip of inspection to its ore properties in the Marquette, Menominee, Mesaba and Gogebic ranges.

F. U. McGraw, formerly connected with the Pittsburgh office of the Erie City Iron Works, has resigned, retiring to his farm in Maryland.

W. M. Corse, works manager of the Lumen Bearing Company, Buffalo, has resigned, to become general manager of the Empire Smelting Company, Depew, N. Y., on January 1, 1914. H. P. Parrock, sales manager, will assume Mr. Corse's duties as superintendent, combining the two offices.

A. E. Crockett, since 1903 secretary and since 1906 also general manager of the Standard Chain Company, Pittsburgh, has resigned, effective December 1, to become connected with the Roanoke Refined Iron Company, which has leased for a term of years the plant of the Loucks Iron & Steel Company, Roanoke, Va. The new company will make melting bar for crucible steel works practice and high grade refined iron bars, the output at the start to be about 200 tons per day. Frank A. Bond, formerly assistant general manager of the Standard Chain Company, succeeds Mr. Crockett as secretary and general manager.

Walter E. Watson, for several years assistant general manager of sales of the La Belle Iron Works, Steubenville, Ohio, has resigned and has been appointed to a similar position with the Youngstown Sheet & Tube Company, Youngstown, Ohio, effective December 1.

John Oliphant, for a number of years president of the Harris Air Pump Company, Indianapolis, has joined the engineering staff of the Sullivan Machinery Company, Chicago, and will have charge of its pneumatic pumping department.

A. L. Horr has been made general manager of the Vulcan Mfg. Company, Fond du Lac, Wis., which is strengthening its position in structural fabrication. He has resigned as vice-president of the Northwestern Bridge & Iron Company, Milwaukee. Previously he served the Modern Steel Structural Company, Waukesha, and the Worden-Allen Company, Milwaukee, in engineering and executive capacities.

James A. McAleenan, formerly a director in the James Lappan Mfg. Company, Pittsburgh, has sold his interest in the company and will give his entire time to private business.

Elwood Haynes, automobile manufacturer, Kokomo, Ind., delivered an address on "Stellite" at the regular monthly meeting of the Engineers' Club, Cincinnati, Ohio, on the evening of November 20.

J. W. Carrel, sales manager of the Lodge & Shipley Machine Tool Company, Cincinnati, Ohio, sailed from New York, November 20, for a three months' tour of Europe.

Rich Crisp has resigned as advertising manager of the

Bishop-Babcock-Becker Company, Cleveland, Ohio, builder of vacuum heating equipment, to become vice-president and general manager of the Krohmer Company, Security Building, Chicago. Lloyd W. Young, formerly advertising manager of the Billings-Chapin Company, Cleveland paint manufacturer, has been appointed his successor as advertising manager of the Bishop-Babcock-Becker Company.

C. M. Daniels, Jr., has succeeded S. H. Reck, resigned, as secretary and treasurer of the Rockford Drilling Machine Company, Rockford, Ill.

## Obituary

OLIVER WHYTE, Boston, Mass., for many years engaged in the wire-cloth industry, died November 18, aged 63 years. A native of Melrose, Mass., he succeeded his uncle, Oliver Whyte, in the firm of Morse & Whyte, Cornhill, Boston, in 1867, and some years later the firm became the Oliver Whyte Company. In 1895 Mr. Whyte established a factory for the manufacture of wire cloth at Medford, and after its destruction by fire four years ago removed the manufacturing business to Portland street, Boston. A new factory is now being built at Medford.

HOWARD B. ANTHONY, secretary and treasurer of the Michigan Brass & Foundry Company, Detroit, Mich., died November 20, after an illness of several months. Going to Detroit at an early age, he was first associated with the Michigan Stove Company and then became secretary and treasurer of the McRae & Roberts Company, brass founder. He leaves a widow and two daughters.

The Lumley-Denly Company has been organized to take over the business of the Ashtabula Mfg. Company, Ashtabula, Ohio. The new company will manufacture the full line of hardware specialties heretofore made by the old concern and will add electrical specialties. Wilfrid Lumley, for several years chief engineer of the Tungstolier works of the General Electric Company, is president and general manager and will have charge of the factory at Ashtabula. Charles T. Denly, who was connected with the firm of Austin & Denly, sales agents, is secretary of the company and will have charge of the sales, with offices in Cleveland.

The Fremont Stove Company, Fremont, Ohio, has purchased the plant of the Wyandotte Foundry Company, Detroit, Mich. The company will operate its two plants as separate units, each being used for the manufacture of one line of stoves. The Detroit plant will be in charge of Arthur Christy. The company is now negotiating for the purchase of another Central Western plant to be used for the manufacture of base burners exclusively. R. J. Christy is president; A. R. Christy, treasurer and assistant manager, and Thomas H. Conway, secretary and general manager.

The Paragon Brass Mfg. Company, Cleveland, Ohio, has been organized with a capital stock of \$100,000 to take over the business of the Sanitary Company, maker of plumbers' brass goods and jobber in various plumbing supplies. The new company will make the same line of goods and will maintain its offices and display rooms in the present quarters, 1221 Superior avenue. Its organization has been completed by the election of H. H. Hackman, president; H. J. Geurink, secretary, and R. C. Koblitz, treasurer.

The Billings & Spencer Company, Hartford, Conn., has developed a new double-acting ratchet which is also reversible. Two removable sockets for taper and square shank drills are furnished, and a feature of the ratchet is that a change of sockets can be quickly made without the need of a wrench. The taper socket will handle all sizes of taper shank twist drills, from  $1/16$  to  $19/32$  in., while the square socket takes bit stock and square shank twist drills. The tool is drop forged and all the working parts are hardened.

The Columbia Steel Company, manufacturer of converter and open-hearth steel castings, Pittsburg, Cal., has just completed a new pattern storage building, 60 x 180 ft., three stories, the erection of which its increasing business made necessary.

## Pittsburgh and Valleys Business Notes

The National Tube Company, Pittsburgh, is showing a series of moving pictures, showing the manufacture of pipe from the ore to the finished product. They represent eight months' work by the company in taking them. Some of the subjects shown are as follows: Drilling for ore in the Northern mines, mining the ore, loading the ore on boats, ore boat on the lake, blast furnace in operation, steel mixer, rolling skelp, lap-weld process of making National pipe, butt-weld process of making National pipe, threading process, various inspections, various tests. The pictures were shown before the Power Club, Pittsburgh, on Saturday, November 22.

Col. W. L. Sibert, the Pittsburgh engineer who was in charge of the work of the Atlantic division of the Panama Canal, was a visitor in Pittsburgh last week, and stated that only the completion of improvements in the Ohio River would enable Pittsburgh to realize its most powerful influence in sea trade.

The Epping-Carpenter Pump Company, Pittsburgh, has been awarded the contract for a 12,000,000 gal. crank and flywheel pumping engine for the city of Jacksonville, Fla.

At the annual meeting of stockholders of the Crucible Steel Company of America, Pittsburgh, held in Jersey City, N. J., November 21, the retiring directors were re-elected and the directors re-elected the officers.

A special meeting of stockholders of the Carborundum Company will be held in Pittsburgh, January 21, for the purpose of voting on the proposed increase in the capital stock from \$2,000,000 to \$2,500,000.

R. M. Rush, Pittsburgh representative of the Kerr Turbine Company, Wellsville, N. Y., has received an order from the Youngstown Sheet & Tube Company, Youngstown, Ohio, for the installation of two large turbine-driven centrifugal pumps to supply feed water for the new power plant of the company.

Dilworth, Porter & Co., Ltd., Pittsburgh, makers of spikes and tie plates, have placed a contract with the Green Engineering Company, Oliver Building, Pittsburgh, for the installation of pneumatic ash-handling equipment, and with Orton & Steinbrenner, Chicago, for coal-handling equipment. The Dilworth-Porter plant is equipped with a battery of five 500-hp. Babcock & Wilcox boilers, which, with the stacks, are being raised five feet to place them above danger from high water, and also to provide better facilities for firing them.

The Pittsburgh office of the Heine Safety Boiler Company, St. Louis, has received a contract for four 250-hp. water-tube boilers to be installed in the boiler plant of the new municipal water works at Erie, Pa.

The report that Max Solomon, scrap iron dealer, Pittsburgh, who bought the rolling mill at Wheatland, Pa., last year, would shortly start it up is untrue. Mr. Solomon states that there is no present intention of starting the plant, and possibly it may be disposed of to other parties.

The Mesta Machine Company, Pittsburgh, has received an order for equipping the blowing engines at the blast furnace of the Girard Iron Company, Girard, Ohio, with air heads, equipped with the new Mesta plate valves.

The Allegheny Steel Company, Brackenridge, Pa., has received an order from the Government for 17,000 mail boxes of new design. The bottom drops to an angle of 25 deg. so that the contents will slide, without handling, into the carrier's bag. The box is larger than the old one, being 26 $\frac{1}{4}$  in. high, 15 $\frac{1}{2}$  in. wide and 8 $\frac{1}{2}$  in. deep. The letter drop is pivoted so that a slight pressure will open it. A handle bar extending clear across the top enables the drop to be opened with an umbrella or the pressure of a package. The opening of the drop is also larger and will admit an envelope 12 in. long and 1 in. thick. Within the box is a guard which prevents robbery when the letter drop is open. Boxes will be made of 12 and 14 gauge steel, the base stock being American ingot iron.

The Petroleum Iron Works Company, Sharon, Pa., builder of steel plate construction, is putting on the market a new product known as the Leader all-steel baler. It can be used for the baling of waste paper, excelsior, tobacco stamps, tin clippings, cloth clippings, etc. The company is now getting in the steel to make the first order for 100 of these machines.

The larger industrial plants at Youngstown, Ohio, are operating this week at a materially reduced rate. At the works of the Youngstown Sheet & Tube Company, Republic Iron & Steel Company, Carnegie Steel Company and others many men have been laid off, owing to the depression in the steel business, and indications are that working forces will be still further reduced. This week the Ohio works of the Carnegie Steel Company is operating at a reduced number of turns, and five of the six blast furnaces are in operation. At the plant of the Youngstown Sheet & Tube Company, No. 1 blooming mill, which was down last week, is running this week, while all the sheet mills are operating, as against 50 per cent. last week. The Bessemer plant of the Republic Iron & Steel Company is running this week, but only 8 out of 10 of the open-hearth furnaces are in operation, while a number of the finishing mills are closed. The Youngstown Iron & Steel Company, maker of black and galvanized sheets and metal specialties, is operating to about 75 per cent. of capacity.

Fred E. Simpkins, Lowellville, Ohio, claims that he now controls personally all the patents of the Seamless Tube Company, which has been making experiments in the rolling of seamless tubes from solid steel billets. He states that H. W. Lindsey is no longer connected with the company.

The Mineral Point Zinc Company, Chicago, has purchased a site of about 60 acres in Tiltonville, near Martin's Ferry, Ohio, on which it will erect a zinc smelter and sulphuric acid plant. That part of the manufactory known as the two-unit roasting plant will be constructed at once. This will consume about 100 tons of raw ore a day and produce about 100 tons of sulphuric acid. The cost of the two original furnaces will be about \$750,000.

The skelp department of the plant of the Wheeling Steel & Iron Company, Wheeling, W. Va., has closed down.

The H. W. Johns-Manville Company announces that its Baltimore branch has been compelled to seek larger quarters to take care of the great increase in its volume of business. The new home of the company is a modern six-story building, with floors measuring 47 x 187 ft., located at 207-13 East Saratoga street, which is within two blocks of the post office and in the heart of the business section. It will include an attractive store and up-to-date offices, in addition to large warehouse accommodations. To facilitate the handling of incoming and outgoing shipments there will be a railroad switch running into the building.

The Pourne-Fuller Company, Cleveland, Ohio, will enlarge its iron and steel jobbing warehouse at 5357 Lakeside avenue, in that city, by the erection of a brick and structural steel building, 116 x 330 ft. The building will have metal sash and corrugated iron roofing. It will be equipped with two electric traveling cranes, a crane runway being provided the entire length of the building. The building will replace one or two old structures on the company's present warehouse site and will provide a large amount of additional warehouse space. Contract for the building has been awarded to the Samuel Austin & Sons Company, Cleveland.

At a special meeting of the stockholders of the Galion Iron Works Company, Galion, Ohio, held recently, the action taken by the directors for the reorganization of the company was ratified. The present company will be taken over by the Galion Iron Works & Mfg. Company, which will have a capitalization of \$1,000,000, namely, \$500,000 preferred and \$500,000 common stock. The old board of directors was re-elected. The reorganization is being effected to give the company larger working capital and to enable it to increase its business.

The programme of improvements now being carried out by the Sloss-Sheffield Steel & Iron Company, Birmingham, Ala., according to President J. C. Maben, calls for an outlay of \$600,000, of which \$300,000 has already been expended. The betterments include new coal washers at several properties, nine new mine openings, the building of workmen's houses and repairs to blast furnaces. A new coke oven plant will be built outside of Birmingham, as the operation of the ovens at the furnace plant inside the city limits will be discontinued.

# The Steel Corporation Dissolution Suit

## Defense Continues to Present Testimony from Competitors and Consumers Showing That Competitive Conditions Prevail

In the last issue of *The Iron Age* the report of the hearings in the Government suit for the dissolution of the United States Steel Corporation was brought down to Monday, November 17. On Tuesday, continuing the hearings at 71 Broadway, New York, George Bartol, president Otis Steel Company, Cleveland, said he was a member of the old plate pool, organized about 1901 and dissolved about 1904. "I think Mr. Schwab was really the prime mover in it in the first place," he said. He added that price fixing was abandoned after the plate pool dissolved, although "we found it was of great advantage to meet and exchange information." The plate pool set a moderate price and tried to maintain it and prevent extreme fluctuation. He said that even since the pool was dissolved prices were never so high and never so low as they had been before its organization.

Mr. Bartol recounted the important historical steps in the development of his company and described the new plant which it is now erecting in Cleveland. It makes steel plates and steel castings principally, but also some forgings. In reference to the Gary dinners, he testified that they were merely "get together affairs" and that they were not held for the purpose of fixing prices. He said that competition between the makers of steel plates is very keen.

Isaac G. Haas, president Empire Plow Company, Cleveland, testified that from 1901 to 1905 he sometimes purchased his material at what was known as a "pool price," but was frequently able to make purchases at less. He said that he buys his steel plates and other raw material on a competitive basis, purchasing generally at lower prices than the quotations which are set forth concurrently in the trade papers.

### Several Buyers of Steel Products Testify

On Wednesday William H. Smith, vice-president W. M. Pattison Supply Company, Cleveland, testified that when a change in prices occurs the steel makers play "follow the leader," and when one concern of any size in the trade sends out a price change the others, as a rule, follow suit. He said that the American Steel & Wire Company, in quoting prices on wire and wire products, is always lower than its competitors, and it therefore obtains most of his wire business. He alleged that the trade papers average about \$1 per ton higher on steel products than the prices at which business is actually done. As an example he gave wire nails, which his company is buying from the American Steel & Wire Company at \$1.65, Cleveland, while the trade paper quotation is \$1.60, Pittsburgh, to which a freight rate of 10c. per 100 lb. must be added for Cleveland. The Pattison Company, Mr. Smith said, always makes its purchases on a competitive basis.

Clarence C. Robbins, secretary and general manager Cleveland Crane & Engineering Company, Wickliffe, Ohio, said his company purchases the steel for its cranes both on contract and in job lots. About 20 per cent. of its purchases have been made from the Carnegie Steel Company. In making purchases, the company first gets bids from various steel makers and then buys at the lowest price and best delivery quoted. He testified that there always has been active competition among steel makers and that prices are never such as to indicate any kind of an agreement between them.

Walter S. Quinlan, purchasing agent of the National Screw & Tack Company, Cleveland, testified that in buying steel he has always found plenty of competition for his orders. His company uses about 10,000 tons annually of wire rods and bar mill products. This material he buys on contract in an advancing market, but in times of depression he prefers not to contract. The prices as quoted him by the various mills during the seven years he has been purchasing agent have always varied, and during that time no two quotations have been alike. The prin-

cipal reason he assigned for this was that the quotations always included the freight rates, which varied for each point. In the past year, he said, he has bought about 75 per cent. of his company's requirements from the Steel Corporation subsidiaries, while in 1907 he bought at least 90 per cent. from these interests.

Pliny O. Dorman, purchasing agent of the Standard Welding Company, Cleveland, testified that he purchased in the last fiscal year about 21,000 tons of hot and cold rolled strips, plates, bars, etc. He does not depend entirely on the trade papers for his information as to market prices, but does all of his buying on a basis of competition. The corporation's subsidiaries and the independents participate in his orders, he declared, upon a competitive basis. Quotations have constantly varied, he asserted, during the last 12 years.

### High Praise for the Steel Corporation

Benjamin F. Miles, president Browning Engineering Company, Cleveland, testified on Thursday that the Steel Corporation had been of benefit to the country. He said:

"Before the Steel Corporation came there was a state of war in the steel trade; every fellow tried to tomahawk the others. I know this, having seen some large batches of notes offered through the banks in the valleys by the Carnegie Company with the understanding that if they would be discounted things would be made a whole lot easier for some of the interests that were allied there."

The Carnegie method, according to Mr. Miles, was to ask the bankers to discount the notes and in return the Carnegie Company would buy material from their districts and would also let up on the sharp competition that was shutting down mills in the bankers' localities.

"Even the notes of the Carnegie Company in those days were questioned, were they not?" asked R. V. Lindbury, of counsel for the defense.

"I have heard them questioned," was the answer.

Mr. Miles stated that the methods existing in the nineties as to competition and prices were responsible for failures and great losses in the steel business. He said: "Under the new conditions which came with the corporation, a steel manufacturer could, after having taken a contract, wake up the next morning without the price of steel having declined \$5 per ton."

He declared that the Steel Corporation has caused greater stability in prices during the last 10 years. He said that competition two decades ago in the steel trade "left an industrial field the way the Iroquois Indians used to leave portions of eastern Ohio." He also likened the situation which existed in the early days among the steel makers to the conditions now prevailing in Mexico, asserting that "there were not many left to fight in the end." The Steel Corporation, he added, has been a benefit to the country and a godsend to the small steel buyer.

### More Testimony from Steel Buyers

Elbert H. Jeffrey, vice-president and general manager Jeffrey Mfg. Company, Columbus, Ohio, testified that most of the purchases of bars, sheets, plates and structural shapes which his company has made for the last 10 years have been supplied by independents, the Steel Corporation's subsidiaries obtaining about 30 per cent. of the total. He said that quotations during that time have varied continuously and he has always found plenty of competition between the different steel makers for his trade. Approximately 70 per cent. of his purchases during that period have been made from companies outside of the Steel Corporation. During the years 1912 and the present year, however, he admitted that practically all of the steel wire required by his concern has been supplied by the American Steel & Wire Company.

Joseph S. Ralston, president Ralston Steel Car Company, Columbus, Ohio, testified that his company uses about 100,000 tons of steel per annum when running at

full capacity. He declared that he purchases all of his steel requirements wherever he can at the cheapest rate. Up to the time of the panic in 1907 he said that his company secured practically all of its supplies from the Lackawanna Steel Company, but since that time has been patronizing the Steel Corporation subsidiaries to some extent, although the greater part of his business has gone to the Cambria Steel Company. He also testified that he always found plenty of competition and that quotations varied.

On Friday Sydney B. Wight, general purchasing agent for the New York Central Lines, testified that he had never been influenced in any way to buy steel supplies from the Steel Corporation nor any other particular concern. He emphatically declared that neither George F. Baker nor the late J. Pierpont Morgan, as common directors of both the New York Central and the Steel Corporation ever instructed, advised or influenced him to buy from the latter. Mr. Wight explained that he had never met either Mr. Baker or the late Mr. Morgan.

Counsel for the defense also questioned him regarding William Rockefeller's possible influence to cause him to patronize the corporation when purchasing steel. Mr. Wight said that he met Mr. Rockefeller once, but the question of steel purchases was not discussed, nor had Mr. Rockefeller ever influenced him in such matters.

The other witnesses were Alvin J. Donnally, of the Cook Spring Company, New York City; R. Wemlinger, president Wemlinger Steel Filing Company, Brooklyn, and Lehigh H. Elliott, secretary-treasurer of the Bourne-Fuller Company, Cleveland, Ohio. All testified as to competitive conditions.

Harold Moeser, vice-president Pickering Hardware Company, Cincinnati, Ohio, at the hearing on Monday, testified that prices of steel products as quoted to him were "sometimes varying, but generally alike." This response caused a clash between the opposing counsel.

Christopher B. Edwards, president Moeschl-Edwards Corrugating Company, Covington, Ky., testified that the price of galvanized roofing has fallen 33 per cent. since the formation of the Steel Corporation. He admitted that quoted prices would remain on practically the same level for months at a time, but explained that he always had to sell under in order to get the business.

Others who testified on Monday relative to competitive conditions were: Charles Osthoff, St. Louis, Mo., manufacturer of horseshoes; John G. Jennings, treasurer Lamson & Sessions Company, Cleveland, and Charles W. Scofield, secretary-treasurer Lake Erie Iron Works, Cleveland.

### Efficiency Increased by Workmen's Lunch Room

Since working hours have been reduced in a number of States, both voluntary on the part of manufacturers and through legislation, the problem of getting a full day's work out of employees has become a matter of more importance than formerly.

It is the custom in the majority of manufacturing plants to allow workmen 30 minutes for lunch, although in a number of instances one hour is allowed. That the afternoon output in many factories does not compare favorably with the forenoon's results is well known to employers. Comparatively speaking, only a limited number have realized the importance of seeing that their employees were served a palatable and nutritious lunch amid pleasant surroundings.

After a long investigation, a manufacturer in the Central West, having over 1200 people on his payroll, was able to locate the trouble in his particular case. His experience will doubtless interest other large employers of both skilled and unskilled labor. The suggestion as to a remedy for the unsatisfactory afternoon's work came from an observing foreman, who had temerity enough to invite the president of the firm to take lunch with him at a neighboring saloon, the only nearby available place. The invitation was accepted, and the president not only had an opportunity to see the class of food served, but the gormandizing methods necessary to get one's share. He could not overlook the fact that it was necessary almost to wash down the "conglomeration" with a glass of beer. Immediately after the whistle blew the foreman piloted the president through departments where women and girls were employed, to find many of them still consuming the remnants of a cold lunch

brought with them, and with the floors littered with lunch boxes.

The remedy applied was in establishing a large dining room for all the employees. While it was not compulsory for the employee to eat in this room, a rigid rule was enforced as to eating lunches in any other part of the factory. A managing chef was employed at first, who was only interested in having the meals served and then getting away. Naturally, the scheme was not a success at the start, and the neighboring saloons still drew their usual patronage. Later the firm employed an expert to take charge of the kitchen, and within two weeks practically all employees were taking their meals in the company's dining room. This chef not only tried to have a variety each day, but paid special attention to palatable dishes that would afford nourishment. If the employee wished to bring his own lunch he could do so, and would be furnished plenty of ice water, dishes, etc., and should he wish to draw from the restaurant supplies he could obtain a cup of tea, coffee or chocolate at a cost of two cents a cup. Tables accommodating 16 persons each were provided with pepper, salt and other condiments, for which there was no charge.

In case the employee wished to take his entire lunch the following prices may serve to show that a substantial meal could be obtained probably cheaper than it could be prepared at home:

	Cents
Meat and vegetable soup.....	3
Roast pork, with sweet potatoes.....	8
Roast ham, with bread.....	10
Roast beef, with noodles.....	8
Pies, different kinds.....	2
Ice cream.....	3

Although all employees are assigned to the same table each day, it is possible for them to arrange to change, by giving notice a day in advance. An employee can also have his dishes brought to his table by the payment of 1c. extra for service. No favoritism is shown anyone, and the president of the company, as well as the other officials, eat the same food, from the same kind of dishes and in the same dining room. No cash is paid out, but employees are provided with tickets, upon request, that are charged to their accounts. The correct amount is punched out by two employees between whom the diners have to pass to their respective tables. In order to avoid confusion in serving 1200 people at one time, they are divided into relays of about 400 persons each, so arranged that each individual may take his lunch at any time between 11:30 and 1 o'clock.

It would probably appear as an exaggeration to state that the increase in efficiency has proved to be over 10 per cent. This increase is more than sufficient to take care of the extra expense involved; and this is easily understood where so many employees are on the payroll. While the books show a loss in this particular department, the ultimate results obtained are sufficiently satisfactory to place the scheme in the revenue-producing class.

### Starting a New Profession

William Jacobus has opened an office as scrap metallurgist and salvage expert at 38 Park Row, New York. The business in which he is engaging is of a unique character, and appears to be worthy of more than the ordinary office-opening announcement. He was formerly expert for the United States Navy Department, and in that capacity rendered such efficient service in the handling and disposing of scrap material as to receive high praise from his superiors. He now proposes to do for large corporations and private individuals what he has done for the Government. He offers his services in the introduction of a scientific salvage system for every business having to deal with scrap metals or with waste or condemned materials of whatever description, adapting the system to the needs of each such business. He has already made connections with a number of scrap producing companies and has testimonials as to the excellent results secured.

The Eastern Steel Company is experimenting with pulverized coal in one of the heating furnaces at its plant at Pottsville, Pa., with a view to its adoption for the open-hearth furnaces later, though, it will be some months before this step is taken.

### The National Founders' Association Meeting

(Continued from page 1223)

agitation after another, cannot be charged to you, so no well-intentioned decent manufacturer can escape the re-

sponsibility to do his proper share, and perhaps more, to bring industry and politics and government and society back to a condition of study, and reason, and understanding, and industry, and of efficiency and sobriety, where it ought to be.

### Social Justice All Around the Circle

An important address on "Social Justice" was made at the banquet of the association, at the Hotel Astor, Wednesday evening, by the Rev. Marion D. Shutter, D.D., Minneapolis. Speeches were also made by L. T. Marechal, K.C., Montreal, on "Canada and the United States," and by Joseph T. Talbert, vice-president National City Bank of New York, on "Pending Currency Legislation." George F. Monaghan, attorney of the association, presided as toastmaster, and with him and the speakers at the speakers' table, were Justus H. Schwacke, Williams Sellers & Company, Philadelphia; George W. Watts, Canada Foundry Company, Toronto, Ont.; President Briggs, Isaac W. Frank, United Engineering & Foundry Company, Pittsburgh, and Philetus W. Gates, Hanna Engineering Works, Chicago.

The address by the Rev. Mr. Shutter was in part as follows: "Every person in the community should have what is due him. It is in harmony with the great gospel of the brotherhood of man. Strength can never shake over its debts to weakness. It is more important to ascertain the causes, when a man is unable to make a living, than to cast about for remedies. There may not necessarily be a fault of society, but a defect in character. There is a danger that we demand more than justice. Exuberance of spirit does not always discriminate."

There is a sentiment that everything is ripening into rottenness. Accusations result in a shameless press, which sets man against man for the sake of selling a few more papers or magazines. Sober exposure may be of immense value, but muckraking for revenue is cruelly devilish. Some of the startling revelations which have been made have shaken confidence in fellowmen. Common honesty and decency impose obligations on those needing justice most. If one thinks he is not getting it, he cannot succeed by becoming a scoundrel. Whatever the responsibilities of Society, the individual cannot shake his own.

Any man should be ashamed to ask for what he can procure himself. There is too much legislation to give man what he ought to provide himself. Law is undermining character. The income tax will raise just about enough money to pay for the army of collectors. Some communities will be composed entirely of Government employees. Now we discuss mothers, old age and other

pensions and there is need to consider before man goes into moral bankruptcy.

The working day has been generally cut down and wages have been increased, and now social justice asks that a fair and honest day's work be given and that contracts be sacredly kept. One of the vicious things is the limit placed on a worker's capacity. Social justice must work both ways. Organized labor is all wrong when it carries itself into the age of barbarism. The minimum wage will undoubtedly be established in some states, but the demands should be so framed that they will be worth it. Losses in business are sometimes reaped through incompetence and the question naturally arises who is to help the employer solve his problem if the minimum wage raises the price without any result. The most irresponsible people in the world are legislators, who throw a fit and call it reform, and other people have to pay the bill. A man is not necessarily a scamp because he has built up a business. In most cases success is a matter of push, not pull. You cannot make a weak man strong by making a strong man weak. You cannot make a dwarf a giant by placing him on legislative stilts. There should be social justice all around the circle. Free speech is one thing; incendiary speech another; freedom is one thing, treasonable speech another. "The problems today," he concluded, "are problems of skill and character; in old fashioned virtues lies our salvation."

#### Reciprocity with Canada

Mr. Marechal, in his speech, said that within the last two years the products manufactured in Canada were equal to the value of manufactured products for the sixteen years previous. Everything is prosperous in Canada, he said. He felt that Canada's action with regard to reciprocity was nothing more or less than a matter of business. It should be possible to raise or lower tariff, according to the needs and resources of the industries. "We are doing the same as you did to us for fifty years. You forced Canada to stand on its own mettle. The policy built up the industries of Canada, and if we are prosperous in commerce and manufacturing, it is due to the stand taken by the American people in refusing reciprocity and it is my duty to thank you."

### Work of Committee on Safety and Sanitation

M. W. Alexander, chairman of the Committee on Safety and Sanitation, began the session Thursday with a review of the committee's work in the past year and what it hopes to achieve in the coming year. So many manufacturers are busy with production, he said, that they are liable to let production crowd protection aside unless there is some stimulus to arouse action. The existence of the committee was justified also by the fact that many members had been working individually, whereas so much was to be gained by co-operation. The committee had become convinced that carelessness of both employees and employers was the most potent cause of industrial accidents, although it is realized that accidents will happen despite the best care of men and therefore appliances and rules for their prevention must be adopted.

In its studies the committee had considered the number of accidents, their cause, nature, what injuries had been inflicted and what remedies might be applied. In order to get a broader basis of experience from which means of prevention might be devised, a letter had been sent to each of the members of the association, requesting data of accidents in their foundries. Replies had come slowly at first, then in good volume and in ten months answers were received from 108 foundries of various capacities and doing various classes of work, citing 2009 accidents. The cases reported were studied and in many instances suggestions as to how repetitions might be avoided were

sent to the employers concerned. These letters had been productive of real co-operation between the committee and members. In fact, Mr. Alexander said, he had been made to feel that his committee was only a part of a larger committee embracing nearly all the members of the association.

#### Some Deductions from Accidents Reported

Coming to statistics, Mr. Alexander said that carelessness of men was responsible for about 85 per cent. of accidents. Of the total about 9 per cent. seemed unavoidable, while 29 per cent. easily could have been prevented by proper devices, which carried that percentage back to the employer. Lack of care on the part of injured employees or their associates were responsible for 62 per cent. of the total. The percentage due to handling molten metal was 23½ per cent., while 12½ per cent. were injuries to eyes from other causes. Of the total 25½ per cent. were encountered in handling material on the floor or ground and 9 per cent. while handling material with the aid of cranes.

Mr. Alexander does not find that the day of the week or hour of the day has any considerable bearing on the number of accidents, a contention which has been maintained by some authorities. Study of the 2009 cases, he said, bore out his view to the contrary. The two hours between 3 and 5 p.m. showed a larger percentage, but the

difference is small. There had been noted 7 per cent. between 8 and 9 a.m. and 13 per cent. between 4 and 5 p.m., but the speaker pointed out that most of the pouring is done toward the close of the day and it was but a natural consequence that more accidents incidental thereto should happen at that time. He also said that daylight was on the wane in that hour, and that it behooved founders to look after their lighting as a factor of safety. He also said that age did not figure so largely as some declared, as results showed that accidents happened to workmen of various ages in numerical proportion in which they are employed.

Accidents reported to the committee which had caused less than two weeks' disability amounted to 86 per cent. This figure was not accepted as altogether accurate by Mr. Alexander for the reason that more serious effects of accidents sometimes developed subsequent to the mailing of the reports. But accepting the figure for purposes of illustration it was found that about 10,000 days had been lost. Allowing \$3 per day as wages, it is seen that about \$30,000 had been lost to employees, but the amount lost by employers was far greater.

#### Proposed that Association Sell Goggles, Etc.

While the committee considered that further reports of ordinary accidents were unnecessary, Mr. Alexander expressed the hope that members would continue to send in those of an unusual character and also not hesitate to ask for suggestions as to how any might be avoided. To illustrate some of the activities of the committee he exhibited several pairs of eye protectors, molders' shoes and leggins, explaining the particular merits or faults of each. In the matter of goggles he declared it was not a matter of how well the manager or employer liked certain types, but how well the workingmen liked them. Manufacturers of such articles had accepted many of the modifications suggested by the committee, and in all cases the changes were arrived at after actual tests. Many molders, for instance, had complained of a goggle which caused considerable pressure on the bridge of the nose, whereon the committee caused one to be designed where the lenses rest upon the cheeks and the complaints ceased. It is the idea of the committee to standardize certain types of goggles, including ones with light lenses for general use and heavy lenses for workers in the chipping gang. At present experiments are being conducted to obtain the most satisfactory colored glasses, not only for foundry and furnace work, but also for welding processes.

The molders' shoes exhibited were of the congress gaiter variety, some made especially high, without projecting soles which might afford a place of lodgment for molten metal and with a concealed strap in the back to obviate any likelihood of catching the trousers. Such shoes, with soles of properly tanned leather to insure elasticity and made of good stock throughout, were to be had in lots of 300 at \$2 to \$2.05 per pair. The speaker said it was not the intention of the committee to standardize any particular make of shoe. While specially made footwear was to be preferred, ordinary congress shoes were acceptable if a leggin is worn and he showed samples of leggins which were in use in the foundry of William Sellers & Co. Inc., Philadelphia. Incidentally the speaker paid a tribute to J. H. Schwacke of that company for his hearty co-operation with the work of the committee. The committee could not approve, however, of the metal clasps with which this type of leggin was fastened to the leg of the wearer, nor of the strap which passed under the shoe of the wearer. The clasps made the leggin non-adjustable, and with the straps, made their removal a slow process, when quickness was essential in some cases where metal had splashed.

As a betterment on this type Mr. Alexander showed a conical shaped canvas leggin which opened in the rear and held tightly to the leg by springs similar to those used by bicycle riders, although the springs were sewed in. These would fit any leg. Asbestos had been experimented with, but had proved too expensive, stiff and hot. Also shown was a leggin with a hood protecting the shoe down to the toe, but this type was considered objectionable in various ways and the point was made that the hood was not really necessary where congress shoes were worn. With regard to shoes and leggins, Mr. Alexander said it was the committee's belief that these articles should be purchased in large lots by the association and kept at

headquarters for sale to the members at cost, a plan which would enable small foundries to buy the few they needed and still get the benefit of the substantial discount obtainable in ordering large quantities.

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Mr. Alexander dwelt at some length on the success of the N. F. A. Safety Bulletin. In one issue of this organ there was included a sample placard bearing the word danger in white letters on a background of red. There immediately came to the committee a demand for thousands of these signs, including an order from the National Association of Manufacturers for 4000. Many letters of approbation attested the good work which the committee had accomplished. Another phase of the work was personal inspections by the committee's assistant of about thirty foundries as a result of which he had made over 200 suggestions for accident prevention, nearly all of which had been accepted. This work is to be enlarged upon. Mr. Alexander believes that the not far distant future will bring into operation a plan of liability inter-insurance among the members, whereby the differences between the various State liability and compensation laws might be made less irritating. He suggested that the American Foundrymen's Association should have the benefit to be derived from the circulation of the Bulletin among its members and expressed the opinion that the different associations should confine themselves to their respective fields in the promotion of safety. The National Association of Manufacturers already had agreed to keep out of the foundries, the committee itself would keep out of the machine shops, and it was hoped that the National Electric Light Association would confine its efforts to the elimination of electrical hazards. Each association should keep to its field but among all of them there should be co-operation.

#### Employers Should Pay for Goggles and Leggins

In the discussion which followed Mr. Alexander's address, H. D. Miles, Buffalo Foundry & Machine Company, Buffalo, N. Y., inquired as to who should pay for the goggles, leggins, etc., used for the protection of the workingmen. Mr. Alexander replied that it was generally agreed that the employer should pay for the goggles and leggins, and replace them without question if necessary, but that shoes were a necessary part of a man's wearing apparel and that he was expected to pay for them. The day might come, however, when the employee would have to wear the proper shoe for his work to get his job, in other words, it would be a part of his trade to have them. But the chairman emphasized that liberality paid in the end.

#### Discussion Brings Out Interesting Points

J. H. Schwacke took the floor at this point to say that Mr. Alexander's address had been so admirably presented that it should be printed and distributed. A resolution to this end was carried. Mr. Schwacke went on to say that his company provides both goggles and leggins and found the expense trifling compared with the saving effected through the prevention of accidents. At first some of the men were slow in adopting the precautions provided, but gradually they fell into line and now the company insists upon the use of the goggles and leggins. Mr. Schwacke said the important thing in safety prevention is to do something, that if the particular leggin regarded as the best cannot be had, then there should be used the best procurable. To a question by H. N. Covell, Lidgerwood Mfg. Company, Brooklyn, N. Y., as to the use of the goggles by a man whose eyes were defective, and who wore ordinary eye-glasses, Mr. Alexander responded by placing a pair of goggles over his own eye-glasses. Mr. Miles said that the work of the committee was so far superior to what had been done by some of the States that he believed it might be well if the association sought to influence industrial safety legislation along similar lines and he inquired as to what might have been done in this direction. The question was pertinent, said Mr. Alexander, but the execution of such a plan was fraught with many difficulties because many state officials were prone to go off at a tangent when suggestions were made. In Massachusetts there were two boards which were responsible for industrial safety, the Board of Labor

### The National Founders' Association Meeting (Continued from page 1223)

agitation after another, cannot be charged to you, so no well-intentioned decent manufacturer can escape the re-

sponsibility to do his proper share, and perhaps more, to bring industry and politics and government and society back to a condition of study, and reason, and understanding, and industry, and of efficiency and sobriety, where it ought to be.

## Social Justice All Around the Circle

An important address on "Social Justice" was made at the banquet of the association, at the Hotel Astor, Wednesday evening, by the Rev. Marion D. Shutter, D.D., Minneapolis. Speeches were also made by L. T. Marechal, K.C., Montreal, on "Canada and the United States," and by Joseph T. Talbert, vice-president National City Bank of New York, on "Pending Currency Legislation." George F. Monaghan, attorney of the association, presided as toastmaster, and with him and the speakers at the speakers' table, were Justus H. Schwacke, Williams Sellers & Company, Philadelphia; George W. Watts, Canada Foundry Company, Toronto, Ont.; President Briggs, Isaac W. Frank, United Engineering & Foundry Company, Pittsburgh, and Philetus W. Gates, Hanna Engineering Works, Chicago.

The address by the Rev. Mr. Shutter was in part as follows: "Every person in the community should have what is due him. It is in harmony with the great gospel of the brotherhood of man. Strength can never shake over its debts to weakness. It is more important to ascertain the causes, when a man is unable to make a living, than to cast about for remedies. There may not necessarily be a fault of society, but a defect in character. There is a danger that we demand more than justice. Exuberance of spirit does not always discriminate."

There is a sentiment that everything is ripening into rottenness. Accusations result in a shameless press, which sets man against man for the sake of selling a few more papers or magazines. Sober exposure may be of immense value, but muckraking for revenue is cruelly devilish. Some of the startling revelations which have been made have shaken confidence in fellowmen. Common honesty and decency impose obligations on those needing justice most. If one thinks he is not getting it, he cannot succeed by becoming a scoundrel. Whatever the responsibilities of Society, the individual cannot shake his own.

Any man should be ashamed to ask for what he can procure himself. There is too much legislation to give man what he ought to provide himself. Law is undermining character. The income tax will raise just about enough money to pay for the army of collectors. Some communities will be composed entirely of Government employees. Now we discuss mothers, old age and other

pensions and there is need to consider before man goes into moral bankruptcy.

The working day has been generally cut down and wages have been increased, and now social justice asks that a fair and honest day's work be given and that contracts be sacredly kept. One of the vicious things is the limit placed on a worker's capacity. Social justice must work both ways. Organized labor is all wrong when it carries itself into the age of barbarism. The minimum wage will undoubtedly be established in some states, but the demands should be so framed that they will be worth it. Losses in business are sometimes reaped through incompetence and the question naturally arises who is to help the employer solve his problem if the minimum wage raises the price without any result. The most irresponsible people in the world are legislators, who throw a fit and call it reform, and other people have to pay the bill. A man is not necessarily a scamp because he has built up a business. In most cases success is a matter of push, not pull. You cannot make a weak man strong by making a strong man weak. You cannot make a dwarf a giant by placing him on legislative stilts. There should be social justice all around the circle. Free speech is one thing; incendiary speech another; freedom is one thing, treasonable speech another. "The problems today," he concluded, "are problems of skill and character; in old fashioned virtues lies our salvation."

### Reciprocity with Canada

Mr. Marechal, in his speech, said that within the last two years the products manufactured in Canada were equal to the value of manufactured products for the sixteen years previous. Everything is prosperous in Canada, he said. He felt that Canada's action with regard to reciprocity was nothing more or less than a matter of business. It should be possible to raise or lower tariff, according to the needs and resources of the industries. "We are doing the same as you did to us for fifty years. You forced Canada to stand on its own mettle. The policy built up the industries of Canada, and if we are prosperous in commerce and manufacturing, it is due to the stand taken by the American people in refusing reciprocity and it is my duty to thank you."

## Work of Committee on Safety and Sanitation

M. W. Alexander, chairman of the Committee on Safety and Sanitation, began the session Thursday with a review of the committee's work in the past year and what it hopes to achieve in the coming year. So many manufacturers are busy with production, he said, that they are liable to let production crowd protection aside unless there is some stimulus to arouse action. The existence of the committee was justified also by the fact that many members had been working individually, whereas so much was to be gained by co-operation. The committee had become convinced that carelessness of both employees and employers was the most potent cause of industrial accidents, although it is realized that accidents will happen despite the best care of men and therefore appliances and rules for their prevention must be adopted.

In its studies the committee had considered the number of accidents, their cause, nature, what injuries had been inflicted and what remedies might be applied. In order to get a broader basis of experience from which means of prevention might be devised, a letter had been sent to each of the members of the association, requesting data of accidents in their foundries. Replies had come slowly at first, then in good volume and in ten months answers were received from 108 foundries of various capacities and doing various classes of work, citing 2009 accidents. The cases reported were studied and in many instances suggestions as to how repetitions might be avoided were

sent to the employers concerned. These letters had been productive of real co-operation between the committee and members. In fact, Mr. Alexander said, he had been made to feel that his committee was only a part of a larger committee embracing nearly all the members of the association.

### Some Deductions from Accidents Reported

Coming to statistics, Mr. Alexander said that carelessness of men was responsible for about 85 per cent. of accidents. Of the total about 9 per cent. seemed unavoidable, while 29 per cent. easily could have been prevented by proper devices, which carried that percentage back to the employer. Lack of care on the part of injured employees or their associates were responsible for 62 per cent. of the total. The percentage due to handling molten metal was 23½ per cent., while 12½ per cent. were injuries to eyes from other causes. Of the total 25½ per cent. were encountered in handling material on the floor or ground and 9 per cent. while handling material with the aid of cranes.

Mr. Alexander does not find that the day of the week or hour of the day has any considerable bearing on the number of accidents, a contention which has been maintained by some authorities. Study of the 2009 cases, he said, bore out his view to the contrary. The two hours between 3 and 5 p.m. showed a larger percentage, but the

difference is small. There had been noted 7 per cent. between 8 and 9 a.m. and 13 per cent. between 4 and 5 p.m., but the speaker pointed out that most of the pouring is done toward the close of the day and it was but a natural consequence that more accidents incidental thereto should happen at that time. He also said that daylight was on the wane in that hour, and that it behooved founders to look after their lighting as a factor of safety. He also said that age did not figure so largely as some declared, as results showed that accidents happened to workmen of various ages in numerical proportion in which they are employed.

Accidents reported to the committee which had caused less than two weeks' disability amounted to 86 per cent. This figure was not accepted as altogether accurate by Mr. Alexander for the reason that more serious effects of accidents sometimes developed subsequent to the mailing of the reports. But accepting the figure for purposes of illustration it was found that about 10,000 days had been lost. Allowing \$3 per day as wages, it is seen that about \$30,000 had been lost to employees, but the amount lost by employers was far greater.

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and Industries and the Industrial Accident Board. Both of these had shown a favorable disposition toward the work of the Committee and, after receiving some of the N.F.A. Safety Bulletins had invited its chairman to attend one of their joint meetings. With this experience as an example he believed that State officials might eventually ask the co-operation of the committee. Replying to another question Mr. Alexander said it was true that some trouble had been experienced through the goggles steaming up, but that paraffin pencils were being brought out to correct the trouble and on these a report would be rendered later.

#### Spread of Eye Diseases a Danger

Oliver Crosby, American Hoist & Derrick Company, St. Paul, Minn., said attention had been called by his shop surgeon to the danger of the spread of eye diseases where several men used the same pair of goggles. Having use for the goggles only occasionally when standing before a grinding wheel they did not carry a pair around with them and several men would use the same pair as needed. Mr. Alexander's remedy for this was a window in a frame over the wheel, through which a man might see what he was doing. Mr. Crosby replied that his experience was that such windows quickly became cut and

cloudy. Mr. Alexander then pointed out that the use of an exhaust system would obviate some of the glass cutting, but that in the end it was cheaper to frequently replace the small windows than to ruin the "natural windows." Theodore O. Vilter, Vilter Mfg. Company, Milwaukee, Wis., expressed the hope that the Bulletin would be circulated among non-members as well as to members of the association. On motion of Isaac W. Frank, United Engineering & Foundry Company, Pittsburgh, the members gave a rising vote of thanks to the committee and to Mr. Alexander for the work they had done. On further motion of Mr. Frank a resolution was passed recommending that the incoming officers make a liberal appropriation for the continuance of the committee's work. Mr. Schwacke urged that the members individually do all they can to promote safety and Mr. Alexander agreed that individual action was better than none at all, but he laid stress upon the fact that the committee stood ready to help at all times. Personally he hoped to see the day when there would be a safety museum at the headquarters of the association. Mr. Miles emphasized that the address of Mr. Alexander afforded a good illustration of what the association had been doing in the line of practical social justice and that the public should be informed of such endeavors.

## Operation of Workmen's Compensation Laws

How the Illinois workmen's compensation law has operated was treated in an address by Staunton B. Peck, Link-Belt Company, Chicago; the Michigan law in an address by C. H. Gifford, American Blower Company, Detroit, and the New Jersey law in an address by H. P. Macdonald, Snead & Co. Iron Works, Jersey City, N. J. All three speakers gave a résumé of the laws in their respective states. In part, Mr. Peck said:

#### Experiences in Illinois

When the manufacturers of Illinois realized, during the fall of 1911, that the State was about to enact a law providing for definite compensation to be paid to employees for injuries or death suffered in the course of their employment, it came for the most part as a distinct shock. It was not the payment of certain sums made practically compulsory that startled and at first aroused a feeling of antagonism, for all manufacturers know that some expense of this kind is inevitable in the conduct of any industry; but the compulsory compensation of the employee regardless of the cause of injury—even though caused by his own negligence or that of his fellow workmen. To the mind of the average employer there seemed an element of unfairness and injustice in this, and judged by strictly ethical standards he was right. But looked at in the same way, there is the same sort of injustice in an employer bearing the expense of spoiled work due to the workman's fault—defective castings, wheels bored wrong, shafts cut off too short, etc. Yet every manufacturer has long accustomed himself to accept such mishaps whatever the cause, without any personal sense of hardship and injustice.

As to the practical working of compensation in Illinois and its effect on the employers, it is yet so recent a departure that any statistics or collective opinions must be of limited value. However, I have interrogated some 32 concerns, founders and workers in iron and steel, both large and small, in the city and throughout the State, as to their observations of the operation of the law and the relative cost to them growing out of injuries before and since its passage. I believe the results of this may be taken as fairly indicative of the State as a whole, or at least of those industries in which we are particularly interested. Of the companies referred to 28 came under the compensation act, and but 4 elected not to. Twenty-seven expressed themselves in favor of the principle of compensation and generally with the provisions of the Act, although many believe in a greater or less degree that it is susceptible of improvement. Five are definitely opposed to the principle of compensation. Twenty-four concerns have carried liability insurance both before and after the passage of the act. Four have not carried insurance either before or after. Three carried insurance previously, but gave it up, and one concern which had not previously carried insurance, insured afterwards.

All five of the concerns who opposed compensation did so on the ground of its, to their mind, unfairness to the employer, to which I have referred above. I firmly believe this feeling will gradually die out, with a better and broader comprehension of the subject. Three of the above concerns who are now operating under the law did not elect to do so immediately after its passage, but after a fuller knowledge of its purpose and effect.

#### Employer Bears Most of the Burden

Of the objections to the Illinois act as it now stands on the part of those who yet believe in compensation and the act as a whole, the most intelligent, and probably the most worthy of serious consideration, is that the whole burden is borne by the employer, and the employee is not made, to some extent at any rate, a co-insurer or a contributor with the employer to the compensation fund. There is a sense of justice in this and much may be said in its favor, though a full discussion is out of place here. A feeling of entire dependence is not desirable in the workman, and unquestionably it tends to the promotion of his self-respect for him to be a contributor in case he is injured, to say nothing of the incentive for him to exercise greater care. It should be noted, however, in favor of the law, that the weekly indemnity paid is only one-half of the average weekly earnings, so that in effect the employee does make contribution to his compensation equal to that made by the employer.

The definite compensations provided, whether they are too much or too little, can hardly be expected in so short a time to meet with the views of every one, and will probably be always more or less a matter of opinion. While some concerns think they are too high, two or three of the very large concerns among the number mentioned above as carrying no insurance had already established beneficial departments voluntarily, the payments from which to the injured employee somewhat exceeded the compensation provisions of the Act.

#### New Law Boosted Insurance Rates

It has been noted that a very large proportion of the companies referred to are carrying liability insurance, and the first and most immediate effect of compensation would here be naturally looked for. The companies interrogated were a unit in the statement that there had been a very material increase in their insurance rates, which is largely the measure to them of the cost of injuries. The increase is definitely stated by eighteen concerns as ranging from 50 per cent. to 500 per cent., the average increase of them all being 275 per cent. It should be said, however, that several of these have found a disposition on the part of the insurance companies to reduce their rates. There is no doubt but what the companies writing liability insurance being wholly without the guidance of experience tables, and actuated perhaps by the feeling that it is easier

to reduce rates than to raise them, felt it necessary to increase their rates far beyond what experience is so far showing to have been necessary. This has undoubtedly been a cause of dissatisfaction, and has led some concerns who had been previous insurers to carry their own risk—at any rate until the insurance companies felt themselves in position to make more attractive terms.

That the insurance companies have been needlessly apprehensive, and that there will gradually be a constant decrease in their rates until they are little if any higher than previously, seems to be the opinion of many. The experience of the concerns, including the Link-Belt Company, who have assumed their own liability since the passage of the act, and of such concerns as know what compensation has cost the insurance companies in their individual instances, does not show any increase in expense which would warrant a corresponding increase of the cost of insurance. Compensation is bound to go a long way toward the elimination of litigation and attorney's fees, which have not been the least of the expenses of the insurance companies.

#### Experience of Link-Belt Plant in Chicago

As some actual figures may be of interest in this connection, I will give the experience of the Chicago plant of the Link-Belt Company. Prior to May 1, 1912, liability insurance had been carried on both the inside and outside force, the total cost of premiums and incidentals being for the year 1911, \$3100. This would have been increased with the best rates obtainable after the passage of the act to \$8,900, or nearly 300 per cent. It was decided that while continuing to carry insurance on outside work where a large proportion of our men were but temporary employees and the chances for safeguarding limited as compared with our inside men, we would carry our own risk within the plant, setting aside a sinking fund for this purpose, based on an assumed rate somewhat lower than the best obtainable rate from the insurance companies. This fund has amounted to \$5470 per annum, taking the average of the 18 months since May 1, 1912, while the total cost chargeable to liability for inside employees computed in the same manner has been \$2770, leaving therefore a net reserve in the sinking fund of \$2700. The figure comparable with this cost for the year 1911, eliminating the cost of outside construction liability, is approximately \$2200, showing an actual increase in cost of \$570 per year. Of this present annual cost of \$2770 but \$1083 is cash actually paid out as compensation, the balance being for medical and hospital services, special treatments, voluntary allowances for time lost, and similar expenses not strictly obligatory. In fact I think the entire increase of \$570 may be accounted for by a more liberal policy in these respects than when carrying insurance.

I might say that one objection that has been honestly urged against compensation by some who otherwise favored it, was that it worked a hardship to the small manufacturer, who was confronted with either paying excessive insurance rates he could ill afford, or taking the chance of an unforeseen or unpreventable-on-his-part accident or two, seriously impairing his capital or putting him out of business altogether. The solution of these difficulties is obviously in equitable insurance rates, which will undoubtedly come to pass with fuller knowledge of the operation of the law, and the anticipation and prevention as far as humanly possible of accidents by safety devices, education and regulations.

With the passage of the Act and the increase in the rates of the regular board companies a stimulus has been given to the organization of mutual liability companies, following along the general lines of the New England mutual fire insurance companies, and these have served not only to materially lessen the burden of insurance on the smaller concerns, but have had a direct effect in a downward revision of the rates of the board companies.

#### Mr. Peck's Summing Up

Whatever may be said for or against the principle of compensation, there are certain definite results growing out of it, about the advantage of which to both employer and employee, and therefore the consumer at large, there can be no question.

1.—It eliminates that detestation of every manufacturer and parasite of the workmen, the shyster lawyer and ambulance chaser, and insures to the injured or their families,

all the money which is paid by the employer as a result of injuries, and that promptly and without long legal delays. A direct result of this elimination of controversy and litigation is the promotion of a better feeling between man and master, which must inevitably result in greater contentment, better work and higher efficiency.

2.—The attention of employers has been focused as never before on the whole subject of accident prevention and safety, not wholly from altruistic motives—though undoubtedly these develop increasingly as we come into more intimate touch with the workman's daily routine—but because the compensation law drives home effectually what we have all known in a rather hazy way, but not wholly appreciated or acted upon, that injuries are expensive and prevention of them pays. Some very large concerns in this State, like the Illinois Steel Company, have established complete and highly organized departments, solely for the purpose of providing devices, and disseminating knowledge among their employees in the interests of safety, but even among the small concerns the same quickened interest is manifested.

3.—Many concerns have not been slow to appreciate the fact that if they are compelled to pay for all injuries sustained by their employees in the prosecution of their work it is manifestly to their own interest to see that they are not held responsible for injuries contracted before the term of employment, or that may develop during employment as a direct result of some physical ailment of disability. Many concerns, therefore, are requiring physical examination by a competent medical advisor as one of the conditions of employment, as well as periodic examinations during employment. These examinations have been most helpful in keeping men physically unfit from occupations where they would be liable to injury, and of direct benefit to the men themselves by the ability of the examining physician to remove many of the ailments when once their existence was discovered.

4.—Again referring to the subject of insurance, I have always felt, and I believe many of you share the feeling that the practical working of liability insurance as of today strikes a discordant note in the harmony of employer and employee. However ably and honestly an insurance company may be administered, its business after all is to get along with as little money paid out to the injured claimant as possible. The very nature of its business is such that it must typify the "Soulless Corporation." To it all men are alike and impersonal, and the relation between employer and employee, with its mutual responsibilities is wholly lacking. Under such conditions it is not surprising that injustice is frequently done and a deep sense of injury and hard feeling engendered. I believe many of us have experienced a feeling not altogether comfortable, as safely entrenched behind our insurance we have seen the pitifully small settlements worthy employees, pressed by necessity and cajoled by the clever attorneys of the liability companies, will often accept.

Under compensation this is all changed; there is no longer an unequal contest between an uneducated needy toiler and a plausible quick-witted lawyer; the insurance is of the same nature as ordinary life insurance, and the payments that are to be made under conditions of disability or death, definitely stipulated, without occasion for discussion or controversy. Under these conditions, the employer may freely carry liability insurance without feeling that he is shirking any of the responsibilities of his position, or shutting his eyes to the fact that an insurance company is treating his employees in a way that he would not personally care to.

#### Michigan Law Satisfactory in General

Mr. Gifford touched lightly on the terms of compensation laws as he said the 22 laws so far enacted differed but little except in details and the subject had been pretty well threshed out. He referred to the various and great interests of Michigan, including the mining, agricultural and industrial fields, and said it was partly due to their antagonism to each other that 15 compensation bills had been presented to the State Legislature in 1911. The bill finally passed resulted from the deliberations of a commission appointed by the governor of the State and was entirely industrial. It is administered by a board with three members, which, he thought, might well be increased to five. He also thought the amount appropriated for the adminis-

tration of the law, \$25,000, should be increased. Of the total number of employees in Michigan, 51 per cent. are in Wayne County, of which Detroit is the county seat. The Michigan law, in Mr. Gifford's opinion, had proved satisfactory in a general way. At the end of the first year of operation 408 fatal accident cases had been compensated to the amount of \$940,000, or about \$2300 each. All told the total compensation paid in Michigan in the first year of the law, including all cases, medical and surgical attention, etc., was about \$3,000,000.

In enumerating the four methods by which employers could protect themselves against liability he said that several large companies had found self insurance to be satisfactory. One of these was the Ford Motor Company, whose average number of employees was 12,135 and whose payroll amounted to about \$9,000,000 yearly. Its approximate expenditure for compensation under the new law was \$20,000, and its self insurance was amply justified. The Cadillac Motor Car Company, with an average of 6700 men and a payroll of about \$5,000,000, also found the expense about \$20,000, the proportionately higher cost being due, Mr. Gifford said, to this company pursuing its medical and welfare work on an extended scale.

Other means of carrying the burden of liability were through the regular stock insurance companies, whose rates are higher than before the enactment of the law; through State insurance and through a mutual company. The operation of mutual companies, with one of which Mr. Gifford is connected, had been found satisfactory. In the case of his own company, not one of the 300 members which started with it had seen fit to withdraw. Mr. Gifford devoted a part of his time to accounts of some of the peculiar cases which had come to his notice, such for instance as the complications growing out of the refusal of an injured man to submit to surgical attention for 24 hr. after an accident and a case where a workman had come to his death through willful misconduct.

### Fact and Figures from New Jersey

Mr. Macdonald, in part, said:

A list of questions was sent to each of our members in New Jersey and to several foundries not members. About 50 per cent. of these replied, and the following is a summary of their answers. These replies covered an average of 1429 employees during the year ending July 4, 1911, before the law went into effect; 1463 in 1912, and 1924 in 1913. Of these 387, or 27.1 per cent., were injured in 1911; 450, or 31.2 per cent., were injured in 1912, an increase of 11.2 per cent. over 1911; 608, or 42.7 per cent., were injured in 1913, or 57 per cent. over 1911. Of these, 34 employees, or 2.4 per cent., received injuries incapacitating them for more than 2 weeks, in 1911; 36, or 2.5 per cent., in 1912, and 48, or 3.4 per cent., in 1913. This shows a percentage of increase of 4 per cent for 1912 over 1911, and 42 per cent. for 1913 over 1911. This marked change was largely due to the returns from one plant. Eliminating them, the figures are as follows: 1911, 34 cases, or 2.4 per cent. of employees; 1912, 31 cases, or 2.2 per cent. of employees, a decrease of 8.3 per cent.; 1913, 36 cases, or 2.7 per cent. of employees, an increase of 13 per cent.

It is generally considered that the increase in accidents is statistical rather than actual, more care now being taken in recording accidents than before the law went into effect. Eighty-six per cent. of the firms elected to employ their men under Section II of the law, which provides compensation according to a fixed schedule for all injuries except in case of willful negligence of the injured, or where intoxication of the employee is the natural and approximate cause of the injury. The burden of such proof rests on the employer. Section I of the law provides for compensation through an action at law. Little or no difficulty has been experienced with employees objecting to working under the section selected by the employer, and where such objections were made employment was refused.

Sixty-one per cent. of the firms reporting carry their own liability risk; 32 per cent. insure their risk in stock companies, and 7 per cent. in mutual companies. Those companies which carry their own risk find that their expenses have not materially increased, if at all, due to the operation of the law. Those insuring in stock companies have found their rate increased several hundred per cent, while those insuring in mutual companies find their ex-

penses are less. In this connection it must be stated that mutual companies did little or no business in New Jersey before the law went into effect.

It is generally considered that safety conditions in the State have improved since the passage of the law. This is due to more rigid inspection and regulation on the part of the insurance and State inspectors, and more attention being paid to the elimination of hazards by employers.

### Few Cases Taken to Court

Seventy-one per cent. of those reporting have noticed no tendency on the part of employees to wilfully injure themselves; but 29 per cent. have remarked on such a disposition, it being apparently due to the fact that some employees belong to benefit organizations, and, when injured, their compensation from their organizations and their employers amounts to more than their wages. Seventy-nine per cent. of those reporting pay separately for each case requiring medical attention; the balance pay a fixed sum per year to a physician or hospital. Fifty per cent. continue medical attention at their own expense as long as the injured requires it, regardless of the two weeks limit imposed by the law.

There seems to be no definite opinion as to whether the relations between employer and employee have been improved due to the operation of the law. Opinion is equally divided as to whether or no injured persons have tried to obtain benefits after they were able to return to work. In no case have the courts been called on to settle a dispute arising under the act, though in several cases the courts have ruled regarding the commutation of weekly payments into lump sums.

### Good Showing of State Liability Commission

A perusal of the report, dated January 30, 1913, of the State Liability Commission, shows that out of 6635 accidents reported to them, 94.2 per cent. came under Section II, and 35 per cent. were entitled to compensation. Eighty-six per cent. received medical attention, at an average cost of \$4.04 for cases not entitled to compensation and \$21.17 for cases involving disability of more than two weeks. Formerly, it is estimated that only 20 per cent. of those injured, received benefits. One hundred and ninety-three fatal accidents occurred or 2.9 per cent. of those injured. Six per cent. of these cases were taken into court for settlement. Many of these involved no dispute; but the judges were called upon to commute the weekly payments into lump sums. But one instance has been recorded where compensation was unpaid, due to the insolvency of the employer.

It is apparent, from this summary, that between such employers and employees as elect to come under Section II, the old antagonism of interests has largely been eliminated. Disputes are almost invariably settled without the necessity of legal intervention, with its accompanying attorneys' fees, and loss of time of principals and witnesses testifying in court. The injured person is assured of proper medical attention, for at least a fortnight after his injury, and reasonable pecuniary aid thereafter; including sums which largely offset disadvantages arising from personal disability. From the employer's standpoint, the absence of compensation for the first two weeks after an injury, the attendance of his own physician on the injured and his right to have his physician examine the injured as often as he may reasonably desire; the reasonable amount of compensation paid for temporary disability, and the distribution of such payments over a lengthy period, largely does away with the temptation, on the part of the employees, to prolong periods of incapacity, and in conjunction with the provision denying compensation to employees who have shown reckless indifference to safety, or who wilfully injure or allow themselves to be injured; to the temptation of a certain class of persons to deliberately contract injuries with the aim of being paid therefor.

### Hope that Insurance Rates Will Be Lowered

Employers have given more study to the prevention of accidents, insurance inspections are more thorough, and minor injuries are prevented from becoming serious through lack of medical care. There can be no doubt that the present law is more liberal to the workman in most respects. On the other hand, it tells him that he is unable to judge what are his best interests; and the permanently injured man who is denied the right of receiving

his compensation in a lump sum, for the purpose of starting in a business for himself, such as that of a small shop-keeper, is deprived of his rights.

There appears to be a strong feeling among employers that stock insurance companies have raised their rates far more than is justified by the increased liability; and the experience of employers who have carried their own insurance seems to bear this out. The liability companies seem to have based their rates on the experience of English and Continental actuaries; and it is to be hoped that data obtained from actual conditions in New Jersey will enable them to materially reduce their rates in the future. This will be accelerated by the competition of mutual companies.

On the other hand, insurance companies maintain that their expenses for inspection of risks have increased, compensation is paid in a larger number of cases, that increased medical attention and the expense of investigation and distribution of weekly payments offset the decreased legal expenditures.

#### Suggestions for State Insurance Fund

One of our members recommends the formation, by the State, of an insurance fund, and making it obligatory for all employers to contribute thereto; stating that by this means insurance rates would be lowered through the elimination of many administrative expenses, duplication of inspection, and other items of overhead cost. The experience of manufacturers in Ohio, Washington and Germany contradicts this theory.

It must be borne in mind that the Labor Party, encouraged by their victory in this case, may shortly attempt

to do away with the safeguards now given the employer, such as the absence of compensation for the first two weeks succeeding an injury, the employment of his own physician, and the right of frequent examination of the injured person during temporary disability. They may also attempt to increase the proportion of wages paid as compensation, lengthen the period for which compensation is paid; and raise or do away with the maximum limit of ten dollars per week. Such changes would be an injustice to the employer, and would soon have the effect of increasing the number of accidents, and become a serious economic burden on the State.

#### Compensation Act in New York Soon

C. A. Chase, Syracuse Chilled Plow Company, Syracuse, N. Y., directed the attention of the meeting to the recent amendment to the New York State Constitution and said it was incumbent upon employers of that State to do their part in bringing about a fair and impartial compensation law, the constitution having been changed to permit the legal passage of such an act. H. W. Bullard, Poughkeepsie Foundry & Machine Company, Poughkeepsie, N. Y., said that a representative of his company had been present at a conference at which Governor Glynn was present and that the latter seemed to be fairly disposed toward the compensation question. Mr. Macdonald said that the manufacturers of his State had lost a great opportunity when the New Jersey law was being prepared by failing to be on hand in sufficient numbers, whereas the labor side had a strong and active representation.

#### Election of Officers and Other Business

The report of the finance committee recommended that the administrative council make ample provision for a more extended circulation of *The Review*, the official organ of the Association.

T. L. Richmond, Buffalo Scale Company, Buffalo, N. Y., reporting as chairman of the nominations committee, expressed the deep regret of the members over the retirement as president of Mr. Briggs and proposed as his successor William H. Barr, Lumen Bearing Company, Buffalo, N. Y. The new president took his seat by unanimous consent and in a few words expressed his appreciation of the honor and his realization of the task before him. Mr. Gifford then read a memorial testifying to the able manner in which Mr. Briggs had conducted the office he had just resigned and expressing the great esteem in which he is held by his fellow members. On motion of Theodore O. Vilter, Mr. Briggs was unanimously elected an honorary member of the administrative council.

Otto H. Falk, Allis-Chalmers Mfg. Company, Milwaukee, Wis., was elected vice-president; J. M. Taylor, Chicago, Ill., re-elected secretary, and the Chicago Savings Bank and Trust Company, Chicago, again selected as treasurer. At a meeting of the new administrative council A. E. McClinton was reappointed commissioner.

#### Personnel of New District Committees

The election of members of district committees resulted as follows:

First District: A. F. Corbin, Union Mfg. Company, New Britain, Conn.; E. A. Jones, E. D. Jones & Sons Company, Pittsfield, Mass.; D. K. Bartlett, Builders Iron Foundry, Providence, R. I.; John A. Mead, Howe Scale Company, Rutland, Vt.; W. B. Leach, Hunt-Spiller Mfg. Corporation, Boston.

Second District: C. A. Chase, Syracuse Chilled Plow Company, Syracuse, N. Y.; F. C. B. Page, E. W. Bliss Company, Brooklyn, N. Y.; Lyman P. Hubbell, Fillmore Avenue Foundry & Iron Works, Buffalo, N. Y.; James Eastwood, Benj. Eastwood Company, Paterson, N. J.; Geo. H. Carver, Adriance Plant, Moline Plow Company, Poughkeepsie, N. Y.

Third District: Matthew Griswold, Jr., General Electric Company, Erie, Pa.; Edward Kneeland, United Engineering & Foundry Company, Pittsburgh; Edward L. Langworthy, Adams & Westlake Company, Philadelphia; W. M. Gardner, Finch Mfg. Company, Scranton, Pa.; Stuart R. Carr, Stuart R. Carr & Co., Baltimore.

Fourth District: C. H. Gifford, American Blower Company, Detroit; W. B. Greene, Palmers & DeMooy Foundry Company, Cleveland; William Gilbert, Buckeye Foundry Company, Cincinnati; W. C. Slater, Bass

Foundry & Machine Company, Fort Wayne, Ind.; F. D. Thompson, Wheeling Mold & Foundry Company, Wheeling, W. Va.

Fifth District: Staunton B. Peck, Link-Belt Company, Chicago; S. B. Lafferty, Red Jacket Mfg. Company, Davenport, Iowa; J. H. Steedman, Curtis & Co. Mfg. Company, St. Louis; James F. Lardner, Rock Island Plow Company, Rock Island, Ill.; E. E. Baker, Kewanee Boiler Company, Kewanee, Ill.

Sixth District: Theo. O. Vilter, Vilter Mfg. Company, Milwaukee; J. L. Record, Minneapolis Steel & Machinery Company, Minneapolis; Frederick Robinson, J. I. Case Threshing Machine Company, Racine, Wis.; J. A. Vail, Fairbanks-Morse Mfg. Co., Beloit, Wis.; C. M. Power, St. Paul Foundry Company, St. Paul.

Seventh District: George W. Watts, Canada Foundry Co., Ltd., Toronto; W. M. Gartshore, McClary Mfg. Company, London; A. R. Goldie, The Goldie & McCulloch Company, Ltd., Galt, Ont.; J. M. Taylor, Taylor-Forbes Company, Ltd., Guelph, Ont.; W. F. Angus, Canadian Steel Foundries, Ltd., Montreal.

Eighth District: E. H. Sholar, Chattanooga Implement & Mfg. Company, Chattanooga, Tenn.; R. W. Boland, Birmingham Machine & Foundry Company, Birmingham, Ala.; E. Y. Hartwell, Hartwell Iron Works, Houston, Texas; John H. McClure, Phillips & Buttoff Mfg. Co., Nashville, Tenn.; H. W. Sanford, Sanford-Day Iron Works, Knoxville, Tenn.

#### Reaffirmation of Association Policy

The following resolution was passed:

WHEREAS, it seems desirable in a voluntary association like this to proclaim from time to time its adherence to those policies of action or conduct which experience has established as being worthy of continuance, and

WHEREAS, a decade has passed since the promulgation of the Outline of Policy adopted by this association in 1904.

We THEREFORE now take occasion formally to reaffirm our belief in the justice and righteousness of those principles, both to the employer and the employee, and to announce that those principles will remain our guide in all dealings with our workmen, and will be carried out in the same manner as in the past.

#### Convention Committees

Some of the convention committees were as follows:

Resolutions—H. N. Covell, Lidgerwood Mfg. Company, Brooklyn; C. E. White, Deere & Mansur Company, Moline, Ill.; E. L. Dawes, Standard Sanitary Mfg. Company, New Brighton, Pa.

Finance—Irving H. Reynolds, Allis-Chalmers Mfg. Company, Milwaukee; H. D. Miles, Buffalo Foundry & Machine Company, Buffalo, N. Y.; M. H. Barker, American Tool & Machine Company, Boston.

## Gears for Machine-Tool Drives\*

Hints on the Selection of the Proper Materials—Methods of Treatment

BY JOHN PARKER†

The basis of this paper is the consideration of the following six questions relating to the use of gears for driving machine tools: (1) Under what conditions is it advisable to use cast-iron or steel gears for machine-tool drives? (2) Are the objections to cast iron on the ground of wear or breakage? (3) What tooth pressure is safe for cast-iron gears? (4) What grades of steel give best results and how should they be treated? (5) How hard is it advisable to make steel gears before machining them? (6) Are they to be hardened after machining, and, if so, to what scleroscope test?

There are a number of well-established gear conditions that are common to the majority of machine tools, which if noted may prove somewhat of a guide in selecting the proper material for the gears, considered from the standpoints of economy, efficiency, and durability. The conditions may be classified, as in the accompanying table.

### *Gear Conditions Common in Machine Tools*

	MATERIAL
A Gears always in mesh, the wear on the teeth being constant	(a) Slow speeds, light duty. Cast iron (b) Slow speeds, heavy duty. Machinery steel (c) Fast speeds, light duty. Machinery steel (d) Fast speeds, heavy duty. Machinery steel, case-hardened
B Gears in sets that are removable and interchangeable with each other, distributing the wear over a number of gears	These are change gears used in thread cutting on lathes, spiral cutting on milling machines, indexing on automatic gear cutters and feed and speed change gears; speeds and pressures are generally moderate. Cast iron, excepting the smallest, which may require to be of steel
C Gears in sets that are non-removable and partially interchangeable, distributing the wear over a number of gears. Changes made while gears are in motion.‡	Used as quick-change speed gears—changes made by levers; speeds and pressures moderate. Machinery steel, case-hardened
D Gears in sets that are non-removable and partially interchangeable, distributing the wear over a number of gears. Changes made when gears are at rest.§	Used as quick-change speed gears—changes made by levers; high speeds and heavy pressure. Machinery steel, case-hardened
E Gears that are employed only part of the time the machine is working, and are engaged and disengaged when the machine is stopped.	This condition applies to back gears for the spindle drive. Gears are made large diameter, coarse pitch and wide face; speeds moderate and heavy pressure. Hard, close-grained cast iron

‡If the changes were made when the machine was at rest, the gears would not require hardening. But custom demands that changes be made while the machine is running.

§Although the changes are supposed to be made when gears are at rest, careless workmen will violate this rule, with the possibility of breaking the engaging gears. Some makers use an alloy steel in their spindle train to prevent breakage, but a better way is to provide means whereby it is necessary to stop the machine before throwing in the gears. This applies to the tumbler type of change gearing.

### *The Use of Cast-Iron Gears*

The objections to cast iron cover both wear and breakage. If the speed is excessive, say about 500 ft. per minute, they are likely to wear quite rapidly; and on slow speeds and heavy pressure breakage will occur, unless they can be made of adequate size, as in the case E, where the back gears are so located in the machine that it is possible to employ large diameters, coarse pitches, and wide faces.

The question of tooth pressures in cast-iron gears is

\*From a paper, substantially in full, printed in the November Journal of the American Society of Mechanical Engineers.

†Machine designer, Brown & Sharpe Mfg. Company, Providence, R. I.

somewhat problematical. The Brown & Sharpe Mfg. Company has in successful operation a gear in the spindle drive of its largest milling machine made from a hard, close-grained cast iron having a tensile strength of 23,000 lb. per sq. in., which when running at the lowest speed sustains a pressure on the teeth of 8250 lb. It is calculated that two teeth are always in contact, which gives 4125 lb. pressure per tooth. The area in cross-section of each tooth is  $1\frac{1}{4}$  sq. in., equaling 3300 lb. per sq. in.; when the gear runs at the fastest speed the pressure is about 1000 lb. per sq. in. It is not known whether the pressure could be increased to any considerable extent, but it has been overloaded to at least 30 per cent. without injuring it; this was when testing out the machine and the overload was of short duration. It might be said that this gear is not subjected to any sudden shock; if it were, the allowable tooth pressure would be considerably less.

For gears that are of small proportions and yet are subjected to heavy duty, it has been found that in cases where the more common steels have failed, excellent results have been obtained from using a 5 per cent. nickel steel. This steel casehardens with a very hard surface and still has a strong and tough core, making it an ideal steel to use where the pressure is heavy or the gear is subjected to shock. Experience shows that drop forgings are more uniform in texture than bar stock. This grade of steel is given an oil treatment and is also annealed before machining; the oil treatment is as follows: heat to 1550 deg. F. and quench in oil. To anneal, reheat to 1350 deg. F. and cool very slowly. It is then ready to machine.

After machining, it is carbonized as follows: Pack in any good carbonizing material and cover very carefully to exclude air, place in furnace and heat to 1700 deg. F., and hold long enough to get the desired depth of casing. Care should be taken to have it heated entirely through. Ordinarily three to four hours will suffice for this process. Then take out of furnace and cool off in the boxes; remove from the boxes and place in furnace or bath; reheat to 1550 deg. F. and quench in oil. Again reheat to about 1380 deg. F. and quench in oil or water according to the size and shape of gear. If the gear is of generous dimensions and free from sharp corners, water is preferably used. Small slender gears are quenched in oil, on account of the liability of cracking if water is used. For ordinary gears the scleroscope test should show 80 to 85 points of hardness. If the gears are used as clash gears they should be drawn to 475 deg. F., or about 70 to 75 points of hardness, by scleroscope test, to avoid chipping.

### *Advisable Degree of Hardness for Steel Gears*

The various kinds of steels used for gears are of such a nature that they do not call for treating before machining, but where extra toughness in shafts is required to withstand torsion and bending strains, 3½ per cent. nickel steel is very satisfactory. This grade of steel is rough machined, then heat treated, as follows: Place in open furnace or bath, heat to 1500 deg. F., and quench in oil. It is advisable to experiment with a small quantity in each batch before subjecting a whole lot to the drawing out heat, which should commence at about 700 deg. F. If the scleroscope registers between 50 and 58, the correct hardness has been obtained; if higher than 58, the parts should be reheated to a higher temperature than before; if lower than 50, the parts must be rehardened. After this treatment, the pieces are finish machined. No further hardening is necessary. When machining, slow speeds and feeds must be used.

Practically all alloy steels and all low-carbon steels are hardened after machining and finished by grinding after hardening. About 0.01 in. on the diameter is left for this operation. All gears should run true, and to obtain this result not only are the holes ground true with the pitch circle, but the hubs are ground on their faces so they will set square with their shafts when tightened up by nuts. The scleroscope test for 30 to 35 point carbon machinery steel is anywhere from 80 to 90, and for 5 per cent. nickel steel for ordinary gears 80 to 85, and for clash gears 70 to 75. All steels are tested by the file in addition to the scleroscope. The file test by an expert is very reliable and some feel that possibly more confidence can be placed on his judgment than on any testing instrument.

The above notes apply to spur and bevel gears. For worm and worm-wheel drives, the worm should be made

of machinery steel, case-hardened, and the wheel of a hard bronze. Both should run in a bath of oil, especially if under high speed and heavy duty. Spiral gears should be used only where the duty is light. The material should be the same as for a worm and wheel, and they should also run in oil to avoid cutting.

For index mechanisms, where accuracy is essential, if the worm is hardened the thread must be ground afterwards. This is done in all the spiral heads of Brown & Sharpe make. Generally, the worm, made of tool steel, is left soft. Worm wheels used for indexing purposes only are usually made of cast iron, and invariably if of large diameter. High-multiple threaded worms for indexing mechanisms should not be used; a double thread can be tolerated but not more, if accurate indexings are required.

#### Appendix

A letter embodying the six questions set forth in the first paragraph was sent out by the Committee on Machine Shop Practice to various machine builders, and the following replies were received:

J. B. Doan, vice-president and general manager, the American Tool Works Company. The American Tool Works Company uses cast iron with slow peripheral speeds and comparatively large diameters; steel for small diameters and high speeds, hardening those which experience teaches need such treatment. The main objection to cast-iron gears is their breakage, and not so much their wear. A good grade of cast iron shows very good wear. A great many steel pinions are used, some of them hardened, working with cast-iron gears of large diameter, the difference of material compensating in strength for the weakness of the pinion tooth, and also for the wear occasioned by the different number of teeth. The Lewis formula is used by the American Tool Works Company for tooth pressures on cast-iron gears. For hardened steel gears the following method with special gear stock made of very low carbon is employed: The gear is machine finished with an allowance of 0.012 in. on the bore for grinding after being heat treated as follows: (a) Pack in round cast-iron box, using 10 per cent. charred leather, 40 per cent. burnt bone, 50 per cent. raw bone; (b) Seal top with mortar of iron filings and fire clay about 1 in. thick; (c) Cover with cast-iron lid and lute with clay; (d) Heat for nine hours to 1560 deg. F.; (e) Remove box from furnace and cool without disturbing contents; (f) Remove pieces and heat to 1550 deg. F. in furnace; (g) Quench in fish oil; (h) Draw in tempering oil to 475 deg. F. Gears are hardened after machining and tested with the scleroscope to 80.

J. B. Green, chief draftsman, Lucas Machine Tool Company. The selection of suitable materials for gears is usually fixed by the character of the machine and its uses. Some machines permit the use of large dimensions, while in others the sizes are often very limited. Cast iron can be used in all places where there is sufficient room for the proper dimensions and, when not overloaded, the teeth wear to a polished and glazed surface so characteristic of this material. When slightly overloaded, the wearing surface of the teeth becomes crushed and cut at the pitch line and then wears out very rapidly; when considerably overloaded, failure occurs through breakage. Semi-steel, when made of the proper proportions, is a very good improvement over cast iron, being strong enough to carry about 50 per cent. more load and giving very similar results in regard to wear and breakage. Low-carbon steel gears will carry from two to two and a half times the load for cast iron; when slightly overloaded they wear a line depression across the face of the teeth at the pitch diameter and when continuously overloaded soon wear out. Steel gears containing about 20 per cent. carbon can be case-hardened after being machined; when so treated they will stand considerable use without wear and are especially valuable for pinions meshing into large gears. The high-carbon and alloy-steel gears will stand loads proportionate with the permissible stresses for the various materials. These steels may be heat treated before machining and then finished to the required accuracy, whereas, if the same pieces were hardened after machining, the resulting distortion would make such an operation impossible. When the nature of the piece will permit, the alloy steels may be hardened throughout when all machining is completed and then drawn to the proper temper so as to make an almost inde-

structible gear. The exact hardness or toughness of teeth must be determined by the uses for which the gear is intended and in many cases experiments are necessary.

E. A. Muller, secretary and manager, King Machine Tool Company. If cast-iron gears were inadequate for their purpose, I should be the first to discard their use. In view of the most excellent results obtained with them, such a move would not be warranted, especially when the substitution of heat-treated alloy-steel gears would simply increase the cost of a machine. Since 1893 I have used Wilfred Lewis's formula for safe working pressure on gear teeth with uniformly excellent results. Neither wear nor breakage has been objectionable; in fact, gears in use six years on machines in hard service show no appreciable wear. Cast-iron gears and steel pinions proportioned in accordance with the Lewis formula should not exceed 1200 ft. pitch line velocity. Experience with gears designed by this formula indicates that cast-iron gears can transmit greater horsepower without failure, but that wear begins to increase considerably as the load increases. The King Machine Tool Company does not use heat-treated or hardened-steel gears at all. In machinery where ample space is provided for gearing, I do not believe that properly proportioned cast-iron gears and steel pinions can be improved upon. However, where conditions obtain as in automobile transmissions, heat-treated and hardened-steel gears are indispensable.

#### Melting Point of Commercial Copper Alloys

As but little information on the melting points of commercial brasses and bronzes can be found in either scientific or technical literature, tests of a few typical alloys were made by H. W. Gillett and A. B. Norton of the United States Bureau of Mines. The results, summarized in technical paper No. 60, are as follows:

Alloy	Approximate composition.			Melting point.		
	Copper	Zinc	Tin	Lead	Deg. Cent.	Deg. Fahr.
Gun metal .....	88	2	10	..	995	1825
Leaded gun metal...	85½	2	9½	3	980	1795
Red brass .....	85	5	5	5	970	1780
Low-grade red brass	82	10	3	..	980	1795
Leaded bronze .....	80	..	10	10	945	1735
Bronze with zinc....	85	5	10	..	980	1795
Half-yellow and half-red .....	75	20	2	3	920	1690
Cast yellow brass...	67	31	2	..	895	1645
Naval brass .....	61½	37	1½	..	855	1570
Manganese bronze...	..	..	..	..	870	1600

The melting point given is the liquidus, or point where the alloy is completely molten. The temperatures are thought to be accurate within plus or minus 10 deg. C. or plus or minus 20 deg. F. Copies of this technical paper may be obtained by addressing the director of the Bureau of Mines, Washington, D. C.

The railroad session of the coming annual meeting of the American Society of Mechanical Engineers is to be held in New York, Wednesday, December 3, at 2 p.m. One paper on steel frame box cars, by R. W. Burnett, general master car builder of the Canadian Pacific, outlines the practice on the Canadian Pacific, particularly in reference to the repairs and to the methods of selecting and treating the lumber for the sheathing and lining. Another paper on steel underframe box cars, by G. W. Rink, mechanical engineer of the Central Railroad of New Jersey, will show the practice of a number of roads and suggests that a committee representing the different roads should be appointed with a view to developing a standard box car.

A pneumatic ash-handling system is in use at the Sixty-eighth street pumping station, Chicago. The equipment includes a Green rotary positive pressure blower and an 8-in. conveyor pipe, which carries the ashes from a flat hopper in front of each boiler to a separator tank, from which an 18-in. exhaust pipe leads to the dust collector. The conveyor duct comprises 212½ ft. of horizontal pipe, 45½ ft. of vertical pipe and four 90-deg. elbows of 15-in. radius. In 2 min., 655 lb. of ashes, averaging 44 lb. per cu. ft. was fed into the conveyor from a boiler at the far end of the system. At another boiler, with the ashes averaging 38 lb. per cu. ft., 894 lb. was fed into the conveyor in 2 min. and 55 sec.

## Trade Publications

**Fuel Oil Burners.**—Gilbert & Barker Mfg. Company, Springfield, Mass. Pamphlet. Illustrates and describes a line of devices for burning fuel oil under low pressure. The use of this fuel as a substitute for coal, coke and gas is briefly touched upon, after which mention is made of the various uses to which oil fuel can be put. A number of views of installations, together with testimonial letters and a partial list of users, are included.

**Bronzes.**—Ajax Metal Company, Frankford avenue and Richmond street, Philadelphia, Pa. Folder and pamphlet. The former points out the advantages of using ingot metal in foundries, with particular reference to the economy of the practice and the high quality of this company's line of ingot metals. The pamphlet relates to Ajax plastic bronze, telling what it is and what is accomplished by its use. In the pamphlet data on the results of tests made on alloys of copper, tin, lead and zinc in varying proportions and combinations are included.

**Floor Surfacing Machine.**—Waywell Chappell & Co., 4845 East Ravenswood Park, Chicago, Ill. Circular. Illustrates and describes a ball bearing floor surfacing machine which is designed as a substitute for the old method of hand scraping. The special advantages claimed for the machine are rapid work, ease of operation and freedom from vibration. In addition to the description of the machine, considerable information as to the work which it is possible to do with it is given.

**Water Softening.**—Harrison Safety Boiler Works, North Philadelphia station, Philadelphia, Pa. Engineering leaflet No. 15. Discusses the better results obtained by treating water when it is hot, rather than cold, it being claimed that the speed of the chemical reaction is greater in hot water. The Sorge-Cochrane hot process system of the vertical and horizontal types is also described, and the different processes employed under varying plant conditions where the water contains sulphate or only a portion of the water requires softening, where there is considerable magnesia present in addition to the permanent hardness, where the softened water is to be used cold and where the hardness is only temporary, are outlined. This system, which was illustrated in *The Iron Age*, October 28, 1909, combines the functions of a water softening apparatus with those of an open feed water heater.

**Buckets and Tubs.**—Brown Hoisting Machinery Company, Cleveland, Ohio. Catalogue E. This is the company's 1914 catalogue, describing and illustrating grab, slag, contractor's and shovel buckets and various kinds of tubs. After the different types have been described at some length, including a number of dimension diagrams, the remainder of the catalogue is given over to views of the various buckets in use for handling ore, limestone, crushed stone, coal, excavated material, sand and gravel.

**Electric Pyrometers.**—Bristol Company, Waterbury, Conn. Catalogue No. 1400, superseding bulletin No. 130. Covers pyrometer equipment for temperatures up to 2000 deg. F. These instruments are made in indicating and recording types for portable and switch-board use, as well as in combinations of both. A frictionless recording type, which has recently been developed, is included in addition to illustrating the different pyrometers, the flexible extension piece of the thermo-couple is featured.

**Bending Tools, Punches and Shears.**—Wallace Supply Company, 108 North Jefferson street, Chicago, Ill. Catalogue and folder. Among the bending machines described is a bar bending tool with which one man can bend, while cold, iron rods 1 in. and under. A pipe bending machine is illustrated which will handle pipe up to and including 2-in. stock and is claimed to leave no mark on the work. Many samples of work done on the company's machines are illustrated. Other tools mentioned are constructed to form light material into angles, eyes, rings and other shapes. Bar cutters, rod cutters, punches, shears and a combined shear and punch are also treated.

**Elevator.**—Nutting Truck Company, Faribault, Minn. Folder, leaflet and mailing card. Describes and illustrates an elevator specially designed for use in mills and factories where employees are obliged to go back and forth between floors in their routine. The machine consists of a wide endless belt, running over heavy pulleys from the bottom to the top of the mill on which steps are fastened at intervals. The steps are designed to carry men and handles are provided. The machine runs constantly while the mill is in operation and is equally useful for ascending or descending. It is claimed that very little power is required. An automatic safety lock step device is provided. A list of users is given.

**Tumbling Barrels.**—Globe Machine & Stamping Company, 1050 West Seventy-sixth street, Cleveland, Ohio. Catalogue. Among the types of barrels made by this company the tilting type is especially featured. It is claimed to be adaptable to a wide range of uses because the same barrel may be used for gentle or violent tumbling by simply changing the angle at which the barrel is run. The operator can secure a sample at any time without stopping the barrel. Cast-iron hexagonal horizontal and sand tumbling barrels and steel balls for burnishing are also treated. Interesting general information in regard to tumbling practice is included.

**Ignition Devices.**—American Coil Company, Foxboro, Mass. Catalogue and leaflet. Describes induction coils, spark plugs,

switches, timers and voltmeters. The vibrator is of the hammer break type, claimed to eliminate complicated adjustment. A combination coil and spark plug is illustrated which is said to combine jump spark simplicity with none of its short-circuiting tendencies. A leaflet deals with a master vibrator designed for Ford automobiles.

**Fans and Heaters.**—New York Blower Company, Chicago, Ill. Catalogue. Size, 6 x 9 in.; 80 pages. Treats of the company's blowers, ventilating and heating fans, and heaters. The fans are built in different styles, such as the steel plate, centrifugal, cone, reversible and double reversible, and they are provided with direct steam or electric drive if desired. The peripheral discharge type is extensively used for supplying blast for cupolas and forges and for exhausting dust from emery grinders, buffing wheels and tumbling barrels. Coil heaters for use in connection with the fan system are illustrated. Several pages of generally instructive data, tables and a page of curves are given.

**Radial Drilling Machines.**—William E. Gang Company, Cincinnati, Ohio. Catalogue. Describes machines of both floor and wall type. The latter are designed for reaming, drilling and countersinking in boiler shops, structural steel and iron works, shipyards, etc. The larger size can be used in gangs as well as individually. A motor is geared directly to the spindle gear and can be mounted on the wall plate. Tables are furnished in plain, tilting, round tilting and full universal style with chuck attachment.

**Transmission Chain.**—Diamond Chain & Mfg. Company, Indianapolis, Ind. Folder. Calls attention to the tests to which the transmission chains of this company are subjected for size and strength, and shows the machine employed for the latter.

**Turret Lathes.**—International Machine Tool Company, West Twenty-first street and Belt Railway, Indianapolis, Ind. Catalogue. Calls attention to the Libby 18-in. turret lathe, which is designed for rapid production. Illustrations of the lathe equipped for belt and motor drive and with the standard chucking tools are given, followed by a complete description of the tool with numerous half-tone engravings. An illustrated description of this lathe appeared in *The Iron Age*, April 27, 1911.

**Air Compressor Accessories.**—Sullivan Machinery Company, 122 South Michigan avenue, Chicago, Ill. Bulletin No. 58-L. In the first portion of the bulletin descriptions of accessories, such as air receivers, reheaters and unloading devices, used in connection with the company's air compressors, are given, and to these have been added a number of tables and a collection of miscellaneous data on the subject of compressed air and its applications. In addition to illustrations of the various accessories there are a number of engravings showing the apparatus in use. An interesting feature of the bulletin is a list of the uses of compressed air, which are presented by way of suggestion to present and prospective users.

**Factory Heating and Ventilating.**—B. F. Sturtevant Company, Hyde Park, Boston, Mass. Pamphlet. Devoted to the subject of heating and ventilating of factories and railroad buildings. After a very brief description of the system used, which is a combination of fan and heater, the remainder of the pamphlet is given over to illustrations of the systems installed in various industrial plants, with a condensed description of the special features. The buildings listed include machine shops, factories and steel mills, car and railroad shops, roundhouses and stations. In addition to the plants illustrated and described a partial list of users of the company's apparatus is given at the end of the pamphlet.

**Sensitive Drilling Machines.**—Cincinnati Pulley Machinery Company, Cincinnati, Ohio. Pamphlet. Contains a brief illustrated description of the Avey high speed, ball bearing drilling machine, which can be furnished with from one to eight spindles for various overhangs. An illustrated description of this drilling machine appeared in *The Iron Age*, October 27, 1910.

**Acetylene Mine Lamps.**—Scranton Acetylene Lamp Company, Scranton, Pa. Bulletin A. Concerned with a line of mine lamps using acetylene gas. The advantages of these lamps are briefly given, and there are views of the two types in which it can be supplied, as well as one in which the lamp has been separated into various parts. In addition to being used in mines, these lamps can also be employed by mechanics and electricians when repair work in dark places is being done.

**Hose.**—New York Belting & Packing Company, 91 Chambers street, New York, N. Y. Catalogue MH. Treats of the Magic continuous hose for water, air, etc. The tube is seamless, reinforced with one or more layers of tightly braided yarn, with rubber layers between. The cover is seamless. The continuous length feature is said to avoid the use of multiple sets of couplings and eliminates waste from remnants. The hose is furnished bound with round tinned, half round or flat, steel wire, woven metallic, marline or combination woven cotton and marline jackets.

**Automobile Boxes.**—Globe Machine & Stamping Company, Cleveland, Ohio. Catalogue. Relates to a line of steel enameled automobile boxes and gas tank covers. The back seams of the box bodies are electrically welded and the bottom is welded to the lugs. The covers are of one piece, pressed and of unusual depth. Boxes are braced with wood to prevent short circuiting if desired. A list is given of automobile makers who use the Globe box as standard equipment.

# The Machinery Markets

Little or no change is discerned in machinery trade conditions in any part of the country. Lack of activity in forwarding new enterprises or making extensive additions to old ones is general, and quiet if not actually dull business is a result. New York houses which continue to find business light and irregular are figuring on a small list for the League Island Navy Yard. In New England the depressed condition of the trade continues, but there are some promising features in the outlook. Orders in Philadelphia have been mostly for single tools and business has been light. The trade in Cleveland is figuring on a list issued by the Lake Shore & Michigan Southern Railroad and demand generally is slow, although the demand for automatic screw machinery is reported to be better than in October. Some of the trade seems to be doing fairly well in Cincinnati, although complaint is heard from the majority. Conservatism in the automobile industry is a contributing cause to dullness in Detroit, where orders are mostly small and scattered, but where the foundries are fairly busy. Milwaukee has had a few good inquiries, but orders are only occasional. Despite irregularity, some improvement has been felt in the Central South, although good business is hampered by the postponement of new enterprises. The volume of machine tool business is not large in the St. Louis territory, but is well distributed. Birmingham reports few new enterprises and dullness in the sawmill line, all of which makes trade slow. Much satisfaction is felt in Texas because of the quick settlement of the strike of the trainmen on the Southern Pacific Railroad. Buying has been fairly satisfactory in Seattle and the first of the year looks promising. In San Francisco there have been some fair orders taken, although the machinery trade is not active.

## New York

NEW YORK, November 26, 1913.

Orders continue few and scattered in the New York territory, as might be expected at a time when there is so little going on in the way of new plant construction or extensions to old ones. Dullness is generally reported, except in some special lines. A manufacturer of refrigerating machinery, for instance, is filling a good export demand, principally from the Far East. The total of business so far this month has dropped considerably below that of the same period last year. As a result of the quiet prevailing in their much traveled routes salesmen are turning their attention to more remote points in their territories where there are isolated plants or industries which buy an occasional machine. Whether or not they buy now, the time can be spared for missionary work which may result in sales in the future. The Bureau of Supplies and Accounts of the Navy Department has issued a list of tools required at the League Island (Philadelphia) Navy Yard, to which New York salesmen are giving attention. Bids are to be opened December 9. The list follows:

Three tool room lathes.  
One 15-in. turret lathe.  
One 24-in. turret lathe.  
Two arbor presses.  
One crank planer.  
One dry and wet grinder.

Other tools for delivery to Charleston, S. C., for which the Government is requesting bids, also to be opened December 9, are:

One bending machine.  
One bolt cutter.  
One sensitive drill.  
One tool grinder.  
One 3-ton hoist.  
One molding machine.  
One plug machine.  
One double punch and shear.  
One double and vertical punch and shear.  
One shaper.

Frisbie, Coon & Co., Troy, N. Y., are planning to build an addition to their plant at Greenwich.

Correcting an item appearing last week, the Gifford-Wood Company, Hudson, N. Y., manufacturer of elevating and conveying machinery and ice tools, will not build a proposed addition until next spring. Machinery for an addition recently completed is being moved from another part of the plant.

The Vacuum Oil Company, Rochester, is erecting a three-story warehouse and compounding plant at Exchange street and the New York Central Railroad, to be of fireproof construction.

The power house which is being erected at the plant of the Hewitt Rubber Company, Kensington avenue and the New York Central Railroad, Buffalo, is to be of large proportions and will cost \$61,000. A radial chimney 250 ft. in height has been completed. A large amount of equipment will be installed.

The Smith Veneer Machinery Company, Inc., Watkins, N. Y., has been incorporated and will establish a plant for the manufacture of special machinery. Able W. Smith and Elmer S. White are the incorporators.

The Lockport Textile Company, Lockport, N. Y., will build a three-story addition to its plant on Niagara street.

The Pollard Mfg. Company, Niagara Falls, N. Y., has awarded the contract for the erection of its plant for the manufacture of stone and marble working machinery. The cost of the plant will be about \$30,000.

The Automatic Railroad Appliance Company, Inc., Rochester, N. Y., has been incorporated with a capital stock of \$500,000 to manufacture railroad appliances and will equip a plant for manufacturing. R. M. Myers, A. J. Bolton and C. J. Brown, Rochester, are the directors.

The power house of the Rochester & Sodus Bay Railroad at Ontario Beach, N. Y., recently destroyed by fire with a loss of \$20,000, is to be rebuilt and re-equipped at once.

A two-story addition, 63 x 164 ft., is to be made to the plant of the Utica & Mohawk Valley Cotton Mills, Utica, N. Y.

The Turner Construction Company, Prudential Building, Buffalo, has received a contract for the new elevator and mill to be erected by the Husted Milling Company, Buffalo, which will require 1400 tons of steel reinforcing bars and 600 tons of structural steel. A large quantity of machinery and equipment will be required for the new mill. E. M. Husted, Chamber of Commerce Building, is president.

Montgomery Bros. & Co., Buffalo, are taking bids for an addition to the boiler house at their woodworking plant, Court and Wilkinson streets and the New York Central Railroad.

The Queen City Foundry Company, Buffalo, recently incorporated with a capital stock of \$20,000 by J. Alfred Gauthier, 445 Crescent avenue, Buffalo, Charles H. Kress and T. Hackett, Tonawanda, N. Y., is having plans drawn for a foundry building to be erected in Buffalo.

An addition is being built to the factory of the Sikes Chair Company, Clinton and Spring streets, Buffalo.

The Buffalo Nipple & Machine Company, 60 Cherry street, Buffalo, has bought the property at the corner of Glenwood avenue and Dupont street. It will increase its equipment about six times. George Keipper is president.

The Builders' Supply Company, Inc., Buffalo, capitalized at \$500,000, has been incorporated to deal in manufacturers' and contractors' supplies. The company has offices in the Ellicott Square Building and distributing depots in the various districts of the city. J. H. Baker, S. M. Hamilton and C. K. Hayes are the directors.

The Niagara Falls Furnace Company, which recently took over the business and plant of the Fremont Furnace Company, of Fremont, Ohio, is completing a new plant on the Erie Railroad, Niagara Falls, where the business of the two companies will be consolidated. A. V. Davidson is president.

Work has been commenced on a 50 x 150-ft. brick and steel addition to be made to the plant of the Heisler Locomotive Works, Erie, Pa.

An addition is being made to the plant of the Griffin Mfg. Company, Erie, Pa.

The Erie Malleable Iron Company, Erie, Pa., has completed the foundry addition which was started last spring and does not contemplate any further construction in the near future. No equipment is needed.

### New England

BOSTON, MASS., November 24, 1913.

The depressed condition of the machinery trade continues without abatement. Reports, filtered through from New York, are that several railroads are about to issue lists and are already making inquiries. Hopeful signs are not altogether rare, taking the manufacturing industry as a whole. For example, the textile mills are showing no indication that the new tariff schedules will affect them seriously, and several announcements of increased production have been made recently. The season is one for the normal let-down, preceding the holidays and the annual taking account of stock. In addition is the hope of lower prices on the part of buyers. The theorists are divided in their opinions. A good average crop, the prospect of a much easier money market, following the moving of the crops and the reduced demand for money which comes with a decreasing market for manufactured goods; the paucity of stocks of materials—these all combine to help the borrower who would go ahead with his plans for expansion. Other observers believe that industry has received a serious blow, but not so serious as to mean a protracted depression. The average of opinion would make the first two quarters of 1914 close to normal, and the last half very good.

The automobile manufacturers of New England are not busy. Men have been laid off in practically all the shops. The motorcycle and bicycle industry is much more prosperous. Announcement is made that the Pope Mfg. Company, Hartford, Conn., now in the hands of receivers, has transferred the entire management of its bicycle division to the factory at Westfield, Mass., which takes care of this department of manufacturing. The personnel of the receivers of the company has not been determined, owing to friction between the various interests represented by the creditors.

Announcements of increased manufacturing capacities and new works are naturally few. As to the laying off of workmen few skilled mechanics are included in the list of idlers.

The United Metal Mfg. Company, New York, will move its business to Norwich, Conn., where it will occupy the plant recently vacated by the Sterling Machine Company. The company manufactures brass fittings and other metal specialties.

The Jager Engine Company has moved its works from Pawtucket, R. I., to Taunton, Mass., where it is occupying space in the building of the Mason Machine Works. The company manufactures combustion engines of the marine type, doing all the work with the exception of the crankshafts.

The Franklin Moore Company, Winsted, Conn., has brought out a chain hoist, with the usual range in capacity, which embodies several improvements in design.

T. E. Macfarlane, Hartford, Conn., will erect a factory building on Holland street, 32 x 112 ft., one story.

### Philadelphia

PHILADELPHIA, PA., November 24, 1913.

Manufacturers report varying conditions of activity. In a few cases close to full productive rate is being maintained, but 75 per cent. represents about the average. In the majority of cases plant operations are maintained on old orders, new business gradually falling off. The volume of new orders coming to merchants continues extremely light and inquiries of any importance are scarce. A recent municipal inquiry involves some equipment for the electrical bureau machine shop. Current sales are mostly small single tools. Power equipment of the smaller class continues in fairly good demand. In second-hand machinery and tools business is small and irregular. Neither manufacturers nor merchants see prospects of any early buying movement, owing to decreased activity on the part of industrial plants. Steel-casting plants are operating to about 50 per cent. of capacity and gray-iron foundries note a decline in new business.

George W. Porter, director of public safety, Philadelphia, will receive bids until November 28 for machine

tools, etc., for use in the electrical bureau as follows: One 16-in. back-geared crank shaper and equipment; one 22-in. motor-driven upright drilling machine and equipment; one Challenge or equal wet and dry grinder complete, with overhead countershaft and wheels; one motor-driven No. 2 Robertson Economy or equal hacksaw with capacity to saw material 6 x 6 in., and a complete set of taps and dies from  $\frac{1}{4}$ -in. to  $\frac{3}{4}$ -in.

The American Pulley Company, Philadelphia, states that recent improvements have increased the capacity of the plant about 25 per cent. Additional warehouse facilities have also enabled the company to maintain larger stocks for prompt shipment. Orders in October were fair, but have slightly declined so far in November. The company is about completing a new office, which will be occupied in December, planning to utilize its present office space for an addition to its machine shop.

William Hunter, engineer, is preparing plans for reconstructing the machine shop and round house at Emerald and Tulip streets, Philadelphia, for the Philadelphia & Reading Railroad.

A permit has been taken for the erection of a one-story garage and repair shop to be erected at 7361 Ridge avenue, Philadelphia, for Charles L. Renz.

The Pennsylvania Salt Mfg. Company has taken out a permit for the erection of an addition to its sulphuric acid manufacturing plant at Delaware avenue and Schunk street, Philadelphia. Plans, which are private, call for a building 44 x 126 feet.

The Elwood Ivins Tube Works, Oak Lane, Philadelphia, is busy, although not so much work is ahead as several months ago. The plant is operating full time and facilities are being extended by the addition of new machinery from time to time.

The Pennsylvania Shafting Company, Spring City, Pa., is operating its plant at full capacity, due largely to an accumulation of tonnage on its books, and will probably so continue for the next thirty or sixty days. New business has recently shown a decline.

The R. S. Newbold & Son Company, Norristown, Pa., continues exceedingly busy in its machine and boiler shop, but is operating the foundry at a reduced rate. This company recently shipped a Mason washer punching machine  $\frac{3}{4}$  to 2-in. capacity to the Lake Shore & Michigan Southern Railroad for making washers from old boiler tubes. Orders for three more washer making machines are in hand, also orders for a large purifier for the Portsmouth Gas Company, several rubber mills, sugar dryers, circle cutting shears and a large shear for the Transcontinental Railway Company. General inquiries are reported good.

It is reported in the daily prints that Clayton Strausser, Mt. Carmel, Pa., is preparing plans for a four-story brick factory building to cost \$30,000, to be erected in that city for the Mt. Carmel & Northumberland Cigar Company.

Fire badly damaged the plant of the Salem Glass Works, Salem, N. J., on November 17. It is understood that the power house, blacksmith shop and boiler plant suffered the most.

### Chicago

CHICAGO, ILL., November 24, 1913.

The Reynolds Electric Mfg. Company, Chicago, will erect a one-story brick factory to cost \$20,000, at 428 South Talman avenue.

Mayer Bros., 501 South Franklin street, Chicago, are having plans prepared for the erection of a three-story brick factory at 1708 Winnebago avenue, estimated to cost \$30,000.

Swift & Co., Chicago, are having plans prepared by B. H. Jillson, architect, for a seven-story brick factory to be erected on Forty-second street and to cost \$100,000.

The Pneumatic Tube Appliance Company, Chicago, has been incorporated with a capital stock of \$10,000, to manufacture pneumatic tubes, valves, appliances, etc., by Joseph H. Stotzel, Frederick C. Oberbeck and Gustav H. Anderson.

The Chicago Gear Mfg. Company, Chicago, incorporated with a capital of \$20,000, will manufacture implements, tools, machinery, gears and, in addition, conduct a machine shop. David E. Cohn, Charles J. Weber, 504 East Forty-ninth street, and Herman Waldman are the incorporators.

The Henry Pratt Company, boiler maker, 2222 South Halsted street, Chicago, is planning the erection of a one-story brick boiler shop to cost about \$14,000.

The Lincoln Ice Company, Chicago, will erect a one-story brick ice-making plant at 4646 Perry street, to cost \$50,000. Plans are being prepared by C. M. Almquist, architect.

The Zouri Drawn Metals Company, 38 South Dearborn street, Chicago, has purchased a site in Waukegan, Ill., on which a \$50,000 plant is to be erected for the manufacture of its product—copper store fronts. The main factory building will be 127 x 310 ft., and in addition a large power house will be built.

The Automatic Gas Regulator Company, Chicago, has been incorporated with a capital stock of \$20,000 to manufacture gas and electric appliances. McDonald Lane, L. A. Landon and J. F. Royer are the incorporators.

The Okadee Company, Chicago, incorporated by Arthur G. Hollingshead, 104 South Hamlin avenue, E. Keig and Paul Carpenter, with a capital of \$25,000, will manufacture and deal in railroad supplies.

The Northwestern Electric Castings Company, Chicago, has been organized to manufacture and sell electrical appliances. Herschel V. Shepard, Howard W. Lewis and William T. Church are the incorporators.

The Voss Calculator Company, Chicago, has been incorporated with \$100,000 capital stock to manufacture calculating machines, by E. C. Ferguson, 10 South La Salle street, H. G. Voss and R. F. Keane.

The Silent Flyer Motor Company, Chicago, has been incorporated with a capital of \$15,000 by William M. Melling, A. H. and Frank Doorfler, to engage in the manufacture of motorcycles and accessories.

The S. G. Gay Company, Ottawa, Ill., has been incorporated with a capital stock of \$200,000 for the manufacture of automobile trucks by S. G. Gay, L. W. Nichols and Chester T. Bangs.

The Elgin Butterine Company, Elgin, Ill., has had plans prepared for a two and three-story factory building, 100 x 100 ft.

The fanning-mill factory at Rockton, Ill., owned by Edward and Walter Knipschild, of Beloit, Wis., suffered a loss by fire on November 17 estimated at \$5000.

The Christopher Electric Light Company, Christopher, Ill., has been sold to F. Schroeder, of Chicago, Ill., who is reported as having plans for improvement.

The Farmers' Elevator Company, Grant Park, Ill., has been incorporated with a capital stock of \$15,000 by George M. Bennett, W. A. Carroll and Eben C. Gower and plans to equip a grain elevator.

The Schaumburg Milling Company, Schaumburg, Ill., has been incorporated with a capital stock of \$12,500 by Henry E. Quindel, Adolph H. Wesemann and Frank C. Rathje and plans to equip a milling plant.

The Mount Carmel Public Utility & Service Company, Mt. Carmel, Ill., has been incorporated with a capital stock of \$300,000 by James E. Robinson, Fred P. Mulhauser, Gustav E. Weil and others.

The Central Illinois Public Service Company, Mattoon, Ill., has increased its capital stock for the purpose of extending its operations and equipment.

The Hawkeye Chemical Company, Clearing, Ill., has been incorporated with a capital stock of \$100,000 by George Makel, R. P. Scott and Frederick Denham to manufacture chemicals.

A bond issue of \$39,000 has been approved by the City Council of Valley Junction, Iowa, for the improvement of the waterworks system.

The Iowa Gate Company, Cedar Falls, Iowa, will start work in the early spring on the construction of its new plant which is to be 100 x 600 ft., paralleling a switch trackage connecting with the Illinois Central Railroad. The estimated cost of the plant is \$60,000.

The plant of the Schmidt Bros. Gasoline Engine Company, Davenport, Iowa, was totally destroyed by fire on November 14, with a loss estimated at \$150,000. Definite plans for rebuilding have not yet been made.

The Economy Excavator Company, Iowa Falls, Iowa, which was recently reorganized, has increased its stock from \$30,000 to \$45,000. It has commenced work on a new factory 72 x 132 ft., which is expected to be completed by January 1. The new building was made necessary by the increase in business since the first shop was erected last spring. The company advises that it will need a boring machine, milling machine, several lathes, drills and other tools, overhead tracking systems, a steam power outfit, heating apparatus, etc.

The Flour City Ornamental Iron Works Company, Minneapolis, Minn., has increased its capital stock from \$500,000 to \$1,500,000.

## Milwaukee

MILWAUKEE, WIS., November 24, 1913.

The machinery trade continues dull, with here and there a booking to break the monotony. During the past week some good inquiries have come in, but few were promising enough to awaken great hopes. It is generally expected that business will be quiet for a month or two. County boards of supervisors are in session and some of them are voting in favor of establishing industrial training schools, a good source of business. Electric and steam railroads will be heavy buyers immediately after the first of the year, preliminary construction work now being under way in several parts of Wisconsin. Tool trade still features the general situation and the satisfactory condition in this line is well sustained. Collections remain slow.

The Evinrude Motor Company, 279-283 Walker street, Milwaukee, manufacturer of detachable rowboat motors, has been reorganized, following the purchase of the interest of Ole Evinrude by C. J. Meyer and associates. Mr. Meyer has been elected president; Walter A. Zinn, vice-president; John F. Koch, secretary and treasurer. The capital stock has been increased from \$125,000 to \$350,000. The company built a new plant a year ago but finds it necessary to make additions. An output of 30,000 motors is planned for the coming year.

The Chicago House Wrecking Company, Chicago, has purchased the plant and equipment of the Milwaukee Motor Company, Thirty-second and Brirleigh streets, Milwaukee, a receiver's sale, for \$86,000. The company was forced into bankruptcy several months ago. The sale will be confirmed by the court, it is said, but nothing can be learned as to the disposition of the plant by the purchaser. The Milwaukee Motor Company manufactured motors for automobile manufacturers.

Schedules of assets and liabilities have been filed by the Stephenson Motor Truck Company, South Milwaukee, against which an involuntary petition in bankruptcy was filed some time ago. Liabilities are given as \$15,576 and assets \$37,306. The plant and machinery will be sold some time in December. Operations were discontinued early last summer.

The estimates for the new Milwaukee County house of correction group, costing \$550,000, as prepared by Leenhousts & Guthrie, architects, for the board of supervisors, place the cost of the power house at \$47,918, and of the heating plant at \$50,000.

The Racine Gas Light Company, a subsidiary of the Wisconsin Gas & Electric Company, is about to extend its lines through South Milwaukee to Cudahy, and will put in a distributing system in both cities.

The William Rahr & Sons Company, malster, Manitowoc, Wis., will make improvements to its power and special equipment. The capital stock has recently been increased from \$800,000 to \$1,000,000.

The A. E. White Machine Works, Eau Claire, Wis., has been incorporated for \$50,000 by Albert E. White and William A. White, to manufacture machinery and to conduct a foundry. The company will specialize in saw swages and swage shapers and other sawmill devices.

The Kewanee Mfg. Company, Kewanee, Wis., is enlarging its factory by a one-story addition.

The American Floor Surfer Company, Green Bay, Wis., has changed its name to Northern Floor Surfer Company. The company recently increased its line of products, which includes electrically driven polishing machines for cement and terrazzo floors and walls.

The Glidden Mfg. Company, Glidden, Wis., intends to install additional power and generating equipment in its saw and planing mill and to operate a commercial light and power plant in connection.

The Twig Shoe Company, Sheboygan, Wis., has purchased a site on Alabama street, near South Eighth street, for the proposed new shoe factory building. The company recently increased its capitalization \$50,000.

The Brillion Iron Works, Brillion, Wis., was badly damaged by a gas explosion which caused serious if not fatal injury to several workmen. Operations are curtailed while repairs and rebuilding are under way. The company manufactures clod crushers, rollers and gasoline engines.

William Smiley & Son, Minneapolis, Minn., who recently took possession of the foundry and machine shop at Eau Claire, Wis., formerly operated by the F. G. & C. A. Stanley Company, are operating the foundry at capacity and expect to reopen the machine shop about February 1. The shops are being rebuilt and rearranged and new equipment will be purchased for the manufac-

ture of gasoline tractors. Eau Claire manufacturers are taking practically all the castings the foundry is able to turn out.

The United Refrigerator & Ice Machine Company, Kenosha, Wis., is planning to extend its output by building machines from 15 to 25 tons capacity in addition to its present line of three-fourths to 15 tons capacity. The company has recently taken over the business of the Viking Refrigerator Company, Kansas City.

The Northwestern and Soo railroads are arranging to build connecting sours in behalf of several large manufacturing plants, including the Waukesha Malleable Iron Company, Werra Aluminum Foundry Company, and Waukesha Motor Company. The companies have been handicapped by reason of inadequate switching facilities.

The E. & H. Motor Company, Sheboygan, Wis., has awarded to C. Ackerman & Son the contract to build a fireproof garage, 50 x 100 ft. The building will contain a completely equipped machine and repair shop.

The Wausau Land Company, Wausau, Wis., intends to build a large sawmill and log-handling plant at Malvern, near Rhinelander, Wis.

The village of Luck, Polk County, Wis., is offering for sale \$4500 worth of bonds, the proceeds of which are to be used for constructing a municipal waterworks system. Jens S. Pederson is president of the village.

The Wisconsin Railway Commission has appraised the value of the properties of the Manitowoc Electric Light Company, Manitowoc, Wis., at \$137,500, and this is equivalent to ordering the sale to the city of Manitowoc, under the public utilities law. The figure is \$40,000 less than that contended for by the private company. As soon as the city takes possession it will make extensive improvements. Henry Stolze is mayor.

### Detroit

DETROIT, MICH., November 24, 1913.

Dullness continues. Orders for tools are scattering and confined chiefly to single tools, although a few bookings for small groups are reported. Extreme conservatism is visible in the automobile industry and purchases made are strictly for replacement purposes. No change is noted in the second-hand machinery market. Some fair bookings are reported from tool builders. Gasoline engines are in steady demand. Both gray-iron and steel castings plants are moderately well engaged. Some new work is reported in construction lines, but no large projects are under consideration.

The New York Bed Spring Company, Detroit, is having plans prepared for a large factory building to be erected at Brady and St. Antoine streets. Details are not available, but it is understood that the factory will be three stories and that some new equipment will be required later.

The Monarch Pattern Works, Detroit, has been incorporated with \$10,000 capital stock to manufacture patterns. John P. Pach and E. J. Swink are the principal stockholders.

The Steam Plant Appliance Company, Detroit, has been incorporated with \$3000 stock by C. Ramond, Robert A. Marrow and others. The new company will engage in the manufacture of steam-plant accessories.

The Headlight Support Company, Detroit, has been incorporated with \$50,000 capital stock to manufacture automobile accessories. Charles R. Chisholm and A. A. Caille are the principal stockholders.

The Detroit Leather Works, Detroit, is erecting a one-story brick addition to its plant.

The Art Stove Company, Detroit, has filed notice of an increase of capital stock from \$350,000 to \$500,000.

The New Brass Works, Detroit, has been incorporated with \$4000 capital stock to manufacture brass and other metal specialties. The incorporators are John B. Schmandt, Hugh T. McClune and Henry Levitt.

The Bundy-Goebel Mfg. Company, Detroit, has been incorporated with \$10,000 capital stock and will engage in the manufacture of brass and aluminum specialties.

The Harrow Spring Company, Kalamazoo, Mich., is erecting a large addition to its plant.

The Auto Tractor Company, Niles, Mich., recently organized and now occupying temporary quarters, is planning the erection of a one-story factory, 90 x 250 ft.

The Flint Varnish Company, Flint, Mich., has increased its capital stock from \$600,000 to \$1,000,000.

The village of Munising, Mich., has voted a \$23,000 issue of bonds for waterworks. Work on the new plant will be begun in the spring.

### Cleveland

CLEVELAND, OHIO, November 24, 1913.

The Lake Shore & Michigan Southern Railroad has an inquiry out for about 25 machines for its new car repair shops at Ashtabula, Ohio. These shops, which are now under construction, will be used for the repair of both steel and wooden cars. The inquiry includes five or six punches and shears and a number of other metal-working machines as well as several wood-working tools. Bids have been taken for the air-compressor equipment for these shops. Generally the machine-tool market is dull with no improvement in the demand or in inquiries. Sales reported are almost entirely single machines, the demand coming from scattering sources. Automatic screw machinery inquiry shows an improvement over October. The demand for cranes is not active. Plants making automobile parts are generally running at less than full capacity. In the foundry trade a demand for gray-iron castings has fallen off and some foundries are anxious for orders. Second-hand machinery is in fair demand.

The National Screw & Tack Company, Cleveland, expects to have its new factory addition completed in about two weeks. It is a five-story brick and steel structure, 40 x 200 ft., to be used for a machine shop and manufacturing purposes.

The German-American Machine Company, Cleveland, has been incorporated with a capital stock of \$10,000, to deal in machinery. The incorporators are Samuel J. Wallace, Walter J. Bader, Samuel Mandeker, Samuel Miller and Lee Sands.

A municipal lighting plant will be built in Upper Sandusky, Ohio. At a recent special election a bond issue of \$25,000 was authorized for that purpose.

Bids will be received by the director of public service, Canton, Ohio, December 17, for the construction of a sewage-treatment plant.

The U. S. Auto Lock Company, Findlay, Ohio, recently organized, has elected E. B. Brokaw president, R. J. Hanrahan secretary and E. C. Edwards treasurer. The locks that will be placed on the market by the company will probably be manufactured in Toledo.

The Clark & Jones Heating & Ventilating Company, Lima, Ohio, has been incorporated with a capital stock of \$25,000 to succeed the business of Clark & Jones, heating and ventilating engineers.

The Willour Mfg. Company, Ashland, Ohio, recently incorporated with a capital stock of \$30,000 to manufacture plumbers' supplies, will place on the market an automatic flush valve and other products. The company plans the establishment of a brass foundry.

James B. Clow & Sons are arranging to double the capacity of their cast-iron pipe plant at Coshocton, Ohio.

### Cincinnati

CINCINNATI, OHIO, November 24, 1913.

Reports from machine tool builders differ materially. One large company has received enough business to keep it operating for the next 30 days. Two or three smaller concerns also state that they are doing fairly well. On the other hand, considerable complaint is heard from the majority, who are not now expecting any improvement until after the holiday season is passed. The reported purchase of a large number of machine tools by a technical school in Chicago is erroneous, but this order is expected to be placed within a few days, and Cincinnati firms expect to receive a full share of the business. Automobile manufacturers are only buying spasmodically and very little business is coming from the railroads. There is no change in the second-hand machinery line, although there are some excellent prospects for power plants in Southern territory. The ice machinery business is said to be good and the local manufacturers report a number of contracts on hand.

The Samuel Trost Box Company, Cincinnati, has made arrangements to move its plant to Covington, Ky. A building at Fourth street and Madison avenue, now occupied by the Cincinnati Pulley Machinery Company, will be its future home. Only a small amount of woodworking and power transmission equipment will be needed.

The Cincinnati Pulley Machinery Company, Covington, Ky., expects to have its new plant on Third street in full operation before January 1. All equipment has been provided for.

H. W. Jenisch, secretary of the Industrial Club, Covington, Ky., announces that the Frank L. Michaels Company will remove its plant from Cincinnati to a building secured at Scott and Third streets, Covington.

ton. The company operates a brass foundry and will need additional equipment.

The Middle West Utilities Company, Chicago, Ill., has plans under way for refitting the plant of the High Voltage Porcelain Company, New Lexington, Ohio. Nothing is known as to machinery requirements.

The Boss Washing Machine Company, Norwood, Ohio, whose plant was recently destroyed by fire, has leased a building at Front and Smith streets, Cincinnati, which is being fitted for the manufacture of washing machines and other specialties.

The Western Ohio Power Company, St. Mary's, Ohio, intends making an addition to its power plant, installed in which will be two 700-hp. water-tube boilers.

It is rumored that the Computing Appliance Company, Dayton, Ohio, recently incorporated with \$200,000 capital stock, contemplates establishing a plant for the manufacture of computing scales. L. O. Shank is president of the company.

The Frank E. Wilson Mfg. Company, Lancaster, Ohio, manufacturer of aluminum specialties, has been reorganized and its capital stock increased for the purpose of adding to its manufacturing facilities.

The Automatic Lamp Control Company, Dayton, Ohio, has increased its capital stock from \$30,000 to \$100,000 and it is currently reported that extensive additions are planned to its factory on East First street.

The American Cash Register Company is removing its plant from Columbus, Ohio, to Saginaw, Mich. Very little new machinery equipment will be required for the new factory.

The municipality of Middleport, Ohio, has voted favorably on a bond issue for a new waterworks plant to cost approximately \$55,000. Bids will be called for as soon as plans are completed.

The city of Huntington, W. Va., will soon let contract for a large garbage incinerating plant.

The Barrett Mill & Lumber Company, Levanna, Ohio, is reported to be planning the installation of metal-working equipment for the manufacture of steel-hull barges and other vessels.

### Indianapolis

INDIANAPOLIS, IND., November 24, 1913.

The Premier Motor Mfg. Company of this city has increased its capital stock from \$200,000 to \$700,000. This year's business outran the company's manufacturing facilities, making more capital necessary. The announcement of this expansion was received with considerable satisfaction by the industrial and commercial interests of the city as rumors of curtailment have been in circulation about the automobile industry here as well as elsewhere.

The Rauh Realty Company has bought the old plant of the Indianapolis Gas Company, occupying about one city block, and will next year build a terminal warehouse and freight station. All railroads will have access to the building, which will be in two units. It will be six stories and basement and will have 30 acres of floor space. A power plant of 1000-hp. capacity and forty-eight elevators will be part of the equipment.

The Central Prest-O-Ceal Company, Indianapolis, has been incorporated with \$50,000 capital stock, to manufacture auto accessories and supplies. H. L. Archey, F. K. Gardner and G. C. Grimes are the directors.

The National Automobile Equipment Company, Indianapolis, has been incorporated with \$10,000 capital stock, to manufacture electrical and mechanical devices for automobiles. N. Burnham, J. A. Martz and G. B. Martz are the directors.

The Buckeye Mfg. Company, Anderson, Ind., maker of gas engines and other machinery, has issued \$100,000 of preferred stock.

The American Motor Vehicle Company, Crawfordsville, Ind., has been incorporated with a capital stock of \$600,000, to manufacture automobile trucks and motors. W. H. Owen, C. S. Rowland and J. V. Wilson are the incorporators.

The flour mill and elevator of the Branch Grain & Feed Company, Martinsville, Ind., was burned recently with \$25,000 loss. E. F. Branch is head of the company, which plans to rebuild.

The Bicknell Light & Power Company, Bicknell, Ind., has increased its capital stock from \$10,000 to \$60,000.

The Bicknell Ice & Cold Storage Company, Bicknell, Ind., has been incorporated with \$20,000 capital stock.

John P. Allen, William Schrolucke and A. L. Brocksmith are the directors.

The Marion Bench & Cabinet Company, Marion, Ind., has been incorporated with \$30,000 capital stock, to manufacture piano stools, benches and similar articles. Thad Butler, J. Wood Wilson and C. W. Henderson are the directors.

The Power Transmission Clutch Company, Rushville, Ind., has been incorporated with \$30,000 capital stock, to manufacture appliances for automobiles. O. E. Woolridge, Jesse Wiley and John Striegler are the directors.

The Miller Vehicle Heater Company, Crawfordsville, Ind., has been incorporated with \$5000 capital stock, to manufacture road vehicle heaters. W. H. Miller, Fred F. Doherty and Austin H. Long are the directors.

The Fisher & Heidt Ice Company, Evansville, Ind., has been incorporated with \$25,000 capital stock. Robert M. Fisher, Jacob G. Heidt and George L. Heidt are the directors.

The Darlington Petroleum Company, Darlington, Ind., has been incorporated with \$25,000 capital stock and plans to drill oil and gas wells. R. P. Cunningham, S. H. Cunningham and J. C. Cunningham are the directors.

The Whiting Pure Ice Company, Whiting, Ind., has been incorporated with \$30,000 capital stock, to manufacture artificial ice. C. A. Hellwig, W. E. Schrage and B. U. Doolittle are the directors.

### The Central South

LOUISVILLE, KY., November 24, 1913.

Improvement is reported by many of the manufacturers of machinery though some irregularity is in evidence. The most disquieting feature of the situation is that many new enterprises have been postponed for the time being on account of the unfavorable financial outlook. The unsatisfactory situation in the boiler field continues, many Southern builders quoting prices which are out of line with manufacturing costs, it is said, and making it impossible for other concerns to get business on a profitable basis. The demand for electrical equipment has shown a gratifying increase, both motors and generating equipment being in excellent call. A number of municipal bond issues have provided the funds for some business while manufacturers using electrical current are adding to their equipment in considerable number.

The Louisville Gas & Electric Company, recently formed by the merger of all of the gas and electric companies of Louisville, has announced that it will enlarge its main power plant by the installation of two 5000-kw. units, the proposed expenditures totaling \$400,000. The company is controlled by H. M. Bylesby & Co., Chicago. Wilbur Hubley is chief engineer.

The Louisville Clothing Company has increased its capital stock from \$30,000 to \$100,000 and will enlarge the capacity of its plant. It will require motors, etc. M. R. Harned is president.

The New Haven Oil & Gas Company, Louisville, will develop property in Larue and Nelson counties, Ky. John L. Harpending is engineer of the company, which will require drilling equipment and other machinery.

The New Albany Box & Basket Company, New Albany, Ind., is erecting a new factory in Louisville to take the place of the plant which was burned some time ago.

The General Construction Company, Inter-Southern Building, Louisville, will install a plant for lighting a large apartment building which it is erecting. The equipment will consist of three 75-hp. return tubular boilers, one 55-hp. and two 75-hp. engines and one 35-kw. and two 50-kw. generators with switchboard equipment. A. M. Cowherd is the engineer in charge.

The Crown Motor Car Company, which was organized in Louisville several months ago for the purpose of manufacturing automobiles, reports that its factory will be at Hamilton, Ohio. B. F. Lambert is president of the company, which has an authorized capital stock of \$500,000.

Frank B. Russell, Columbia Building, Louisville, has purchased a 17-acre site at Eighteenth and Burnett streets. It will be used for manufacturing purposes, but nothing will be done for the present.

The Flannelly-Clarkson Auto Company is equipping a garage and repair shop at Jackson street and Broadway, Louisville. M. H. Flannelly, E. J. Clarkson and others are interested.

Chas. H. Brady & Co., Inc., Owensboro, Ky., has been incorporated with a capital stock of \$100,000 to equip a series of cold storage plants and abattoirs.

The Independent Ice & Coal Company, Paducah, Ky., has been incorporated with a capital stock of \$15,000 by R. Caliss, G. U. Steinhauer and others for the equipment of an ice making plant.

The American Iron Works, Frankfort, Ky., has been incorporated with \$25,000 capital stock by Charles H. Gerrard and John, C. E. and A. Hardy.

The factory of the Bluegrass Products Company, Carlisle, Ky., was burned last week with a loss of \$15,000.

Thomas Moore, Winchester, Ky., is planning the manufacture of a patented derrick. Capital has been provided, it is said.

Girdler, Donnelly & Higgins, Somerset, Ky., have established the Main-street garage, and are equipping it for automobile repair work.

J. T. Duncan, Douglas, Ga., and E. McD. Baechtel, Hagerstown, Md., are planning the establishment of a hosiery mill at Nicholasville, Ky.

The Kentucky Utilities Company, Lexington, Ky., which recently purchased a power plant at Valla, Ky., to be used in supplying the coal mines with electricity for power, will establish substations at Middlesboro and Pineville, Ky., in the mining district.

The Clive-Donovan Shirt Company, Lexington, Ky., which was recently organized with \$15,000 capital stock, is now purchasing equipment for its plant.

Munfordville, Ky., is considering the establishment of a waterworks system. Address the mayor.

The Frick Machinery Company has established a branch at Hazard, Ky., on account of the development of that territory from a lumber manufacturing standpoint. J. E. Garrett is in charge of its sawmill sales at that point.

Mowbray & Robinson, Cincinnati, Ohio, have purchased a large tract of timber on Line Fork, Letcher County, Ky., and will establish a sawmill.

The power plant of the B. F. McCormick Lumber Company, Winchester, Ky., was damaged by fire November 17 to the extent of \$2500.

The Lexington Machine & Mfg. Company, Lexington, Ky., has been incorporated with \$15,000 capital stock to sell machinery of all kinds. James Love and Lee I. Parks are officers of the company.

The Perry Coal & Lumber Company, Lexington, Ky., has been incorporated with \$1,500,000 capital stock for the purpose of developing coal and timber properties in Perry County, near Hazard, Ky. Thomas J. Hartley, Columbus, Ohio, is president and general manager. The concern will establish offices in Lexington.

The Illinois Central Railroad, with general offices in Chicago, is reported to be planning the establishment of large repair shops at Paducah, Ky. Work will begin about January 1, according to reports.

Mays & Schlinker, Glasgow, Ky., have leased an electric light plant at Scottsville, Ky., from J. D. Read and will install an engine and dynamo.

M. B. Jones will establish a factory at Leitchfield, Ky., for the manufacture of ax and tool handles. Power and woodworking machinery will be needed.

Beaver Dam, Ky., has voted to issue bonds for the establishment of a waterworks and electric light system.

The washing plant of the Central Kentucky Phosphate Company, Versailles, Ky., was burned November 19 with a loss of \$10,000. The equipment will be replaced. E. C. Bowman is president of the company.

J. W. and H. R. Reams, Lowland, Tenn., plan the erection of a flour mill. Their old plant was destroyed by fire recently.

Quincy B. Love, Clarksville, Tenn., is in the market for boilers, engines and other equipment for the power plant of a large hotel to be constructed at Huntsville, Ala.

A cold storage and ice plant will be established by the Southern Securities & Mortgage Company, Nashville, Tenn. Donaldson Williamson is general manager of the company.

The Southern Nut Lock & Bolt Company, Nashville, Tenn., has purchased the Ford foundry at Church and Thirteenth streets in that city and is equipping it for the manufacture of a patented bolt and nut. W. H. Buchanan is president of the company.

E. G. Wright, W. A. Cantrell and E. E. Johnson are planning the establishment of a hosiery mill at Jasper, Tenn.

The New Era Machine Works, Nashville, Tenn., has installed equipment for remodeling and repairing printing equipment. A. N. Sherg is manager.

The Erwin Electric Light & Power Company, Erwin, Tenn., has been incorporated with \$15,000 capital stock by J. Fred Johnson, T. H. Morris and others.

Paris, Tenn., is considering the installation of addi-

tional equipment in its water plant, following recommendations which have been made by fire underwriters.

Henry Nicholas is reported to be planning the establishment of a butter and cheese manufacturing plant at Franklin, Tenn.

The Franklin Ice & Cold Storage Company, Franklin, Tenn., will install a 15-ton ice machine, work on the building having been begun. Address General Manager Denton.

The Sanders-Craig Lumber Company, Huntsville, Tenn., R. F. D. No. 4, will equip a plant for the manufacture of gum and oak lumber. J. L. Sanders, of Lewisburg, is president, A. V. McLain treasurer, Ira Pylant manager.

The Holston Marble Company, Memphis, Tenn., has been incorporated with a capital stock of \$50,000 by R. Z. and C. B. Roberts and C. F. Barclay, James S. Hall and J. B. Jones to equip a marble quarry.

The city of Jackson, Tenn., is reported as having plans for the expenditure of about \$25,000 on additional waterworks plant equipment.

The Price & Ruhl Lumber Company, Dyersburg, Tenn., has plans for the operation of a mill with a daily capacity of 20,000 feet of hardwood lumber. Equipment to cost \$8000 will be installed. G. S. Price is manager.

## Wheeling

WHEELING, W. VA., November 24, 1913.

The Tri-State Motor Car Company, Wheeling, W. Va., has been incorporated with \$10,000 capital stock to build a garage by Louis P. Frobe, G. E. Griffin, Morris Jacobs, S. K. Johnson and Thomas Halpin, of Wheeling.

Work has been begun on a new foundry for Christman & Goodman at Morgantown, W. Va. The new plant will be larger than the present one and new machinery and equipment will be installed.

A site of 10 acres has been purchased near Charleston, W. Va., by the Rollin Chemical Company, which will establish a plant there. The parent plant is in England. Mr. Rollin, who is promoting the company, has located in Charleston, W. Va.

The Petroleum Products & Chemical Company, Charleston, W. Va., has been incorporated with \$1,500,000 capital stock by F. L. Writner, New York; G. W. Boggs, R. G. Finley, Cleveland, Ohio; E. A. Robinson, Mt. Vernon, N. Y.; C. W. Staufffer, Detroit, Mich.; Vladimar B. Rule, Cincinnati, and Leo Loeb, Charleston, W. Va.

The Horse Creek Block Coal Company, Charleston, W. Va., has been incorporated with \$100,000 capital stock by G. B. Combs, P. R. Hendrick, A. A. Honaker and others.

The United States Roofing & Tile Company, Parkersburg, W. Va., has been incorporated with \$400,000 capital stock to manufacture roofing tile by Ed. R. Patton, T. J. Wetherell, M. W. Mullen and others, of Parkersburg, W. Va.

The Ennis Coal Company, Hiawatha, W. Va., has been incorporated with \$150,000 capital stock by E. J. McQuail, James M. McQuail, J. P. Johnson and others, of Elkhorn, W. Va.

The Progressive Mfg. Company, Wheeling, W. Va., has been incorporated with a capital stock of \$100,000 to manufacture wrapping machines by John H. Felmedee, Stephen B. Dawson, Wheeling, W. Va.; Walter J. Grapp and others, Pittsburgh.

The Allbright Smokeless Coal Company, Kingwood, W. Va., has been incorporated with \$850,000 capital stock by Alvin Rice, M. D. Faunce, E. Hackathorn and others, of Akron, Ohio.

The People's Light, Heat & Power Corporation, West Point, Va., is reported to be in the market for a 250-hp. boiler and a 200-hp. engine, direct connected with a 150-kva. alternator.

## St. Louis

ST. LOUIS, Mo., November 24, 1913.

The volume of machine tool trade continues low in the aggregate, but it is well spread over the St. Louis territory, indicating that there is no particularly weak spot. Conservatism is expected to continue for some time, at least until after the first of the coming year, as there is little disposition, according to reports, to engage in new enterprises or the extension of old ones until after the annual balance sheets are made up. On such business as is moving no difficulty as to collections is reported. Second-hand tools are in some request, but with no accentuation of that feature.

The Eureka Brass Mfg. Company, St. Louis, Mo.,

has purchased a tract of land near the Terminal Railway in North St. Louis which is to become the site of a large brass foundry. The company specializes in the manufacture of bronze, brass and aluminum castings, railroad car journal bearings and babbitt metals. The Loheide Mfg. Company, St. Louis, has increased its capital stock from \$40,000 to \$50,000 for the purpose of adding plant equipment.

The Hamilton & Ryan Construction Company, St. Louis, has increased its capital stock by \$10,000 to add equipment for general contracting work.

The St. Louis Screen Company, St. Louis, has purchased a site for a plant which, it is stated, will involve an investment of \$1,000,000 in buildings and equipment when completed.

The Killark Electric Mfg. Company, St. Louis, has been incorporated with a capital stock of \$12,000 by Joseph Desloges, William Wurdack and Walton D. Woolley, to equip a plant for the manufacture of electric devices.

The Freise Packing Company, St. Louis, has been incorporated with a capital stock of \$17,000 by William Freise, Albert Freise, George Freise and others and plans to engage in meat packing.

The Central Cigar Box Company, St. Louis, has been incorporated with a capital stock of \$15,000 by Frank M. Erb, A. Klinkenspor, Louis J. Schuttenheim and Harry E. Graeff, and plans to equip a plant for the manufacture of cigar boxes.

The Universal Cutter Company, St. Louis, has plans for the immediate erection of a factory at 4567 Scott avenue, which will cost with mechanical equipment about \$50,000. J. B. Gury is president.

The Charter Oak Stove Company, St. Louis, will increase its capital stock from \$400,000 to \$500,000 as soon as legal formalities permit and will increase its equipment.

The S. W. Morten Lumber Company, St. Louis, has been incorporated with a capital stock of \$15,000 by C. W. Morten and A. W. Smith, Wright Building, and plans to equip a mill.

The Commonwealth Feed Mills Company, St. Louis, has increased its capital stock by \$10,000 and will increase its equipment.

P. M. Modisett, Hannibal, Mo., and W. D. Dent, Oakwood, Mo., have plans for the early establishment of a fire clay plant at Whiteside, Mo.

The Ruwart Saddlery Company, Jefferson City, Mo., has increased its capital stock by \$28,000 and will increase its plant equipment.

The Allee-Jordan Lumber Company, Jefferson City, Mo., has been incorporated with a capital stock of \$75,000 by J. S. Franklin, Lee Jordan and W. S. Allee.

The Home Produce & Mfg. Company, Butler, Mo., has been incorporated with a capital stock of \$30,000 by F. H. Crowell, E. G. Zey and C. H. Burgess to engage in manufacturing.

The Acme Advertising Novelty Company, Kansas City, Mo., has been incorporated with a capital stock of \$25,000 by H. E. Bockemohl, A. S. Johannis and others to manufacture novelties for advertising purposes.

The Standard Briquette Fuel Company, Kansas City, Mo., has plans for the increase of the equipment of its plant.

W. E. Womble, of Womble, Ark., is reported as having plans for the equipment of a water plant at that point including gasoline engine and turbine pump, with other power and electric generation equipment to follow.

The city of Prairie Grove, Ark., is reported in the market for equipment for an electric light plant and waterworks. W. H. Mack is mayor.

The Phoenix Coal Company, McAlester, Okla., has been incorporated with a capital stock of \$200,000 by W. H. Arnold, of McAlester, Elmer E. Persing and Richard E. Plunkett, of Washington, D. C., to equip and develop coal properties in Oklahoma.

The Muskogee Wagon Wood Company, Muskogee, Okla., has been incorporated with a capital stock of \$30,000 to manufacture wagon wood stock. The company has purchased the plant at East Muskogee, 150 x 400 ft., formerly occupied by the Bedell Mfg. Company, together with the machinery used by the latter company. The little additional machinery required will be purchased in the near future. Among the incorporators is F. D. Field, formerly president of the Pioneer Hardware Company, Wagoner. A. M. Kirkland, manager of the Pioneer Hardware Company; D. N. Fink, president of the Commercial National Bank, Muskogee; H. H. Ogden, president of the First National Bank, and A. C. Trumbo, cashier of the Muskogee National Bank are directors. J. F. Owens is treasurer.

The Co-operative Mfg. & Sales Company, Oklahoma City, Okla., recently incorporated with \$100,000 capital stock by D. A. Radle, G. W. Thompson, J. W. Stevens and others will materially enlarge the small plant which it recently acquired for the manufacture of threshing machines.

The city of Broken Bow, Okla., will equip a waterworks system to cost about \$25,000, under the direction of J. E. Davis, of Caddo, Okla., as engineer.

A factory for the manufacture of hoops will be equipped at Greenwood, Miss., by Meyer & Swank.

A sawmill for the manufacture of shuttle blocks will be equipped at Yazoo City, Miss., by Price & Norris.

The Long Beach Vegetable & Fruit Canning Company, Long Beach, Miss., has been incorporated with a capital stock of \$12,500 by J. J. Bailey, M. M. Moody and D. L. Hayes and others and will equip a cannery plant at once.

The Byhalia Gin Company, Byhalia, Miss., has been incorporated with a capital stock of \$9000 by E. T. Lindsey, E. S. Gross and others and will equip a ginnery.

The Davis Bros. Lumber Company, Ansley, La., will erect a band mill for the manufacture of hardwood lumber.

The Godchaux Company, Napoleonville, La., will install canning equipment in its sugar factory at that point.

The W. F. Johnson Lumber Company, Shreveport, La., recently incorporated by W. F. Johnson, F. H. Ford and others will remove a plant acquired at Coushatta to Campi, La., and add some equipment.

H. E. Currie, Chataignier, La., is reported in the market for a band mill with a capacity of 20,000 ft. of hardwood daily, including power plant.

## Birmingham

BIRMINGHAM, ALA., November 24, 1913.

A dearth of new enterprises, with dullness in the sawmill line and less inclination to purchase equipment for factories and mines than has been the case in some time, is reported. A fair demand for small gasoline engines is noted and repair machine shops report some activity. Machine tools are a drug on the market. Engines and boilers are moving slowly. General hardware business is maintaining its own, but in all other lines trade is extremely quiet.

The Continental Gin Company, Birmingham, Ala., has let a contract to P. E. Bostick to erect a new factory building for the enlargement of a cotton gin manufacturing plant.

The Gadsden Brick Company, Gadsden, Ala., will install electric apparatus to take the place of steam in operating its plant.

J. H. Edwards and others, Bessemer, Ala., have organized a company to take over, enlarge and operate a sawmill plant.

The West Pratt Coal Mining Company, Birmingham, has been incorporated with a capital stock of \$100,000. The company will open coal mines at Dora, Ala.

H. E. Jacobi and associates will establish a canning plant at Molino, Ala.

The Centerville Lumber Company, Centerville, Ala., will build a sawmill at a cost of \$25,000.

Albert Henderson, Albany, Ga., has plans for the establishment of a factory to manufacture an invention known as the cotton picker's helper, which is equipped with propelling mechanism enabling cotton to be picked more rapidly.

The Savannah Lighting Company, Savannah, Ga., contemplates moving its plant to new quarters and improving it by the installation of additional electric machinery.

J. C. Edwards & Son, Griffin, Ga., will establish a machine shop and garage. It will be operated by electricity.

The Southern Ice & Power Company, Fort Meade, Fla., has been incorporated with a capital stock of \$50,000 to establish an ice plant. A. P. DeVane is president.

The Carpenter-O'Brien Lumber Company will establish an extensive lumber plant at Broward City, near Jacksonville, Fla., on a tract of 1000 acres. S. J. Carpenter, president of the company, is president of the Tremont Lumber Company, Winnifield, La.

Z. Spinks has begun the erection of a mill for the manufacture of cypress shingles at Oviedo, Fla.

J. C. Lovelace, Jacksonville, Fla., will rebuild a planing mill recently burned.

Mechanical and Civil Engineers,  
PITTSBURGH, PA.

## Texas

AUSTIN, TEXAS, November 22, 1913.

The trainmen's strike on the Southern Pacific between El Paso and New Orleans threatened to affect business activities along its lines, but the quick settlement of the difficulties prevented any extensive tie-up of industrial enterprises and construction work. The weather has been generally favorable except in some localities of western Texas where rain has done some slight damage. Very little cotton is unharvested.

Construction work has begun on the round house and machine shops of the Atchison, Topeka & Santa Fé Railway at Brownwood, upon which \$1,000,000 will be expended. H. D. McCoy, of Cleburne, Tex., has the contract for all the buildings.

A company is being organized at Brownsville with a capital stock of \$150,000 by H. E. Williams of Dallas to erect a large cold storage plant for truck and other products.

The Magnolia Petroleum Company will erect a large pump station near Cleveland for its pipe line.

The City Council of Rockdale is contemplating the construction of an entirely new waterworks plant at that place and the extension of the distributing system.

The Beckrell cotton gin at Nevada was destroyed by fire last week. The gin, which was rebuilt this year at a cost of \$10,300, will probably be rebuilt a second time.

Little & Willett, of Buffalo, N. Y., and T. J. Driscoll, of Indianapolis, Ind., are planning to construct a gas pipe line from the new Mexia gas field to Waco, a distance of 40 miles, to supply that city and intervening towns with natural gas. The project will cost about \$500,000, it is stated, and will involve considerable machinery. The two firms are said to have contracted with the Mexia Oil & Gas Company, the Central Texas Oil & Gas Company, the Trinity Valley Oil & Gas Company, and Craig, Logan & Johnson for 104,000,000 cu. ft. of gas per day.

The Deming Alfalfa Dairy Ranches Company, Deming, N. Mex., has given the contract for the installation of 40 pumping plants, including No. 3 American Well Works centrifugal pumps and forty 10-hp. Rumely oil engines to J. W. Dymond. The Rio Mimbres Irrigation Company in the Deming district of New Mexico is sinking new wells and will later install pumping machinery.

## San Francisco

SAN FRANCISCO, CAL., November 18, 1913.

A few important orders have been recently booked and this week opened with a slight increase in single-tool inquiries and sales. Business is by no means active, however, and considerable complaint is heard from machine tool merchants, who look for no marked improvement before spring. Most other lines are also quiet, though the rain has brought an increase in some lines of construction work, and several new quarries, gravel plants, etc., are being equipped. Increase of equipment is contemplated by many local manufacturing plants, but a disposition to wait until the outlook for next year is better defined is evident. On the whole, however, a more cheerful feeling has been noted for the last fortnight, based mainly on better prospects for next year's crops. Notwithstanding continued reports of dullness in the Southwest, due to the Mexican situation, large installations of smelter equipment are still progressing in Arizona and frequent small inquiries are coming out for mining machinery. Considerable business in mill and logging machinery is expected to result from the opening of Philippine Island forests for development.

The United States Steel Products Company has ordered five double-trolley Shaw electric cranes for its San Francisco distributing station.

The Anderson-Barngrover Company, San José, Cal., has placed an order with Harron, Rickard & McCone for a 60-in. boring mill, a 20 x 12 lathe, and a No. 1½ milling machine.

The Lewis Motor Truck Company is moving its plant from San Francisco to Oakland and is adding a few tools which have already been purchased.

Kleiber & Co., this city, will shortly equip a motor-truck assembling plant.

In equipping manual training schools the tendency is to purchase tools of a substantial character. Sales made out of local stocks last week for the Fresno High School included a 20 x 12 Le Blond lathe, a 12 x 6 lathe, Norton grinder, shaper, etc.

The city engineer has nearly completed specifications for 100 new cars for the municipal electric railway. Bids will be called for shortly for machine tools for the municipal road amounting to \$20,000.

The Pacific Gas & Electric Company is drawing plans for a power station on Commercial street near Montgomery.

The Palatine Iron Works, San Francisco, has been incorporated with a capital stock of \$10,000 by R. Glaser, A. Sellmeier and A. Hartman.

To furnish rock for the Exposition paving a steam shovel has been placed near Fort Baker, and a 20-ton locomotive crane will be used at the Exposition wharf.

The California Building Material Company is considering the establishment of a new gravel plant between Livermore and Pleasanton, Cal.

The California Glass Insulator Company, now located at Long Beach, is preparing to build a plant at Torrance, Cal.

Bert Neil has bought out the Moron Boiler Works, Taft, Cal.

The Schnelly, Hostrawser & Pedgrift Company has secured a permit to build a woodworking plant at Sixth and Jackson streets, Oakland.

The El Centro Planing Mill Company, El Centro, Cal., is putting up a new plant.

The Eagle Iron & Brass Foundry, San Diego, has bought the foundry of G. W. Simpson.

The town of Redlands, Cal., is taking figures on two deep well pumps of 100 miners' inches capacity.

## The Pacific Northwest

SEATTLE, WASH., November 19, 1913.

While no marked increase in business is reported, conditions are fairly satisfactory and indications continue favorable for an exceptional amount of business about the first of the new year. Bearing this point in mind and believing that 1914 holds something in store for them, the local machinery houses are confidently waiting. Collections are fair.

The City Council of Seattle recently passed an ordinance appropriating \$100,000 which will be used in the construction of the first unit of a steam auxiliary to the present municipal light and power plant. The board of public works has been instructed by the council to issue a call for bids for construction of the plant, with 5000 kw. capacity, costing not less than \$225,000. Last year a \$425,000 bond issue for this purpose was authorized at a special election. A. L. Valentine, chairman, board of public works, will receive bids shortly for the construction of the plant.

The utilities committee of the City Council of Seattle recently introduced an ordinance appropriating \$20,000 from the light depreciation fund to be used for installing heavier electrical machinery at the substation of the municipal light and power plant at Seventh avenue and Yesler way. New machinery is needed to care for increased business.

A. F. Ghiglionie & Son, 4719 Sixth avenue South, Seattle, recently retained V. W. Voorhees, architect, Eitel Building, to prepare plans for an addition to be built to their canning plant. About \$25,000 will be spent in improvements and additional machinery.

The Carman Mfg. Company, Tacoma, Wash., will erect an addition to its furniture manufacturing plant in Seattle. Some new machinery will be needed.

The Arlington Garage & Machine Shop Company, Arlington, Wash., will erect a garage building. Some machinery will be needed. Neil Brown is manager.

E. F. Gregory, a capitalist of Tacoma, Wash., and others will build an electric power plant on Clover Creek.

R. L. Fisher, Raymond, Wash., has been granted a franchise to build an electric light and power plant in Lebam, Wash. Work of construction will begin shortly.

The city of Quilcene, Wash., has had plans prepared for a water system for domestic use and irrigation purposes. Bids for construction will be received in the near future.

W. B. Du Bois, of the V. P. Du Bois Lumber Company; F. M. Kettenring, of the Lucia Lumber Company, and S. M. Bernard, of Pittock & Leadbetter Lumber Company, all of Vancouver, Wash., recently organized the Buxton Lumber Company, and incorporated with a capital stock of \$50,000. A mill will be built near Buxton.

The National Lumber & Mfg. Company, Hoquiam, Wash., has been incorporated with \$1,500,000 capital stock by Henry Wicks, Youngstown, Ohio; John A. Finch, Charles Hussey, W. J. C. Wakefield, Spokane, Wash.; W. V. Mack, Aberdeen, Wash.; A. L. Paine

and T. W. Tebb, of Hoquiam. A lumber mill and manufacturing plant will be built in Hoquiam.

The Bay Ocean Natatorium Company, Bay Ocean, Ore., is preparing plans for a natatorium which will cost \$35,000. A 350-hp. plant will be built. Other machinery will be needed. Camp & Dupuy, 426 East Alder street, Portland, Ore., are the architects.

The city of Shoshone, Idaho, recently voted to purchase the waterworks system. Extensive improvements and additions will be made to the plant.

The Intermountain Milling & Elevator Company, Salt Lake City, Utah, will erect a grain elevator with a capacity of 10,000 bushels at Bancroft, Idaho.

C. A. Ramsey, H. J. Rutherford and others of Valdez, Alaska, owners of the Ramsey-Rutherford mining properties, plan making considerable extensions and improvements, including installation of new machinery and mill equipment.

### Eastern Canada

TORONTO, ONT., November 22, 1913.

The factory of the American Radiator Company, Brantford, Ont., will be enlarged. The Canadian head office will be removed from Toronto to Brantford, Ont.

It is announced that the Spalding Company will erect a factory at Brantford, Ont.

The Murray Sign Company, Ltd., Toronto, Ont., has been incorporated with a capital stock of \$100,000 by Cecil de Grey-Murray, Albert Tuckey and others to manufacture and erect electric signs.

Blair Brothers, Ltd., Woodstock, Ont., has been incorporated with a capital stock of \$100,000 by Bertrand Blair, James C. Blair and others to manufacture cement pipes, drain pipes, etc.

The Trent Valley Canners, Ltd., Trenton, Ont., has been incorporated with a capital stock of \$1,000,000 by B. H. L. Symmes, G. W. Morley and others.

The Breslau Wood Products Company, Ltd., Breslau, Ont., has been incorporated with a capital stock of \$25,000 by J. H. Dixon, E. H. Dedels and others to manufacture furniture.

The Fisher Motor Company, Ltd., Walkerville, Ont., has been incorporated with a capital stock of \$600,000 by C. F. Garaghty, Detroit, Mich., F. E. Fisher and others to manufacture automobiles, machinery, etc.

The St. Thomas Bronze Company, Ltd., St. Thomas, Ont., has been incorporated with a capital stock of \$200,000 by Maurice Alexander, Colville Sinclair and others, all of Montreal, to manufacture brass, bronze, etc.

Tenders are being received by C. F. Monroe, township clerk, Stamford, Ont., for a pumping plant for use in the new waterworks system.

G. Garter, Sons & Co., Ltd., have completed plans to build a 700-bbl. flour mill at St. Mary's Ont.

The Canadian Slate Company, Ltd., Quebec, Que., has been incorporated with a capital stock of \$100,000 by F. J. Foley, J. H. Fleet and others.

The Donnacona Paper Company is building a sulphite mill which will be in operation in the spring. The company is at present being supplied by the Riordon Pulp & Paper Company, Montreal.

The Laurie Machinery Company, Ltd., Montreal, has been incorporated with a capital stock of \$25,000 by Walter Laurie, A. E. Woodworth and others to manufacture machinery and supplies.

The Reid-Donald Steamship Company, Ltd., Montreal, has been incorporated with a capital stock of \$100,000 by W. L. Shanks, Francis G. Bush and others to build ships.

The Canadian Bronze, Ltd., Montreal, has been incorporated with a capital stock of \$2,000,000 by P. R. Diamond, G. C. Jones and others to manufacture brass, bronze, etc.

The Canadian Water Purifying Company, Ltd., Montreal, has been incorporated with a capital stock of \$40,000 by L. A. David, L. J. M. Dugas and others to manufacture filters, etc.

The Vaudreuil Electric Company, Ltd., Vaudreuil Station, Que., has been incorporated with a capital stock of \$50,000 by D. P. Gillmor, G. R. Drennan and others to operate as an electric light, heat and power company.

The Ford Motor Company will soon begin manufacturing automobiles in a large plant on the Marsh Road, St. John, N. B. The plant will supply the maritime provinces.

### Western Canada

WINNIPEG, MAN., November 21, 1913.

A fair demand for small lots of machinery supplies is reported. It is not expected that there will be any great improvement in the next few weeks, but leading authorities continue to predict more activity after the first of the coming year. Although a lull in industrial expansion is noticeable at present throughout western Canada, practically all existing plants are working to capacity and are good buyers of machinery parts for repairs and improvements. It is expected that financial conditions will be better in a couple of months, and that work will go ahead on industrial propositions that have been under contemplation for some time.

The Northwestern Brass, Ltd., Winnipeg, Man., has been incorporated with a capital stock of \$1,000,000, by P. R. Diamond, G. C. Jones and others, of Montreal, to manufacture brass, bronze, etc.

The Oglivie Flour Mills Company will shortly make improvements at its elevator at Fort William, Ont. The shipping facilities will be enlarged so as to load 20,000 bushels per hr. into the vessels.

The Northland Milling Company, Saskatoon, is erecting a plant which will have a capacity of 60,000 bushels.

At the annual meeting of the Saskatchewan Cooperative Elevator Company, Regina, Sask., a few days ago, it was announced that a large number of new elevators would be erected next year at points that are now inadequately served.

The citizens of Prince Albert, Sask., have granted by vote concessions to the Royal Machinery Company, Brockton, Mass., which is preparing to manufacture farm implements and machinery at Prince Albert.

The town council of Swift Current, Sask., is having plans made for a power house. G. D. Arnott is secretary-treasurer.

The legislature of Alberta is preparing legislation that will prohibit the bonusing of industries, a practice which had become very common throughout the province. It is said that Saskatchewan is contemplating similar steps.

The Hunt Mfg. Company, Walla Walla, Wash., maker of threshing machines and other agricultural implements, is reported contemplating the erection of a branch factory at Wabanum, Alberta.

Snow & Baker, of Whitefield, N. H., will erect an overall factory at Calgary, Alberta.

The Western Milling Company, Calgary, Alberta, will build a 1200 bbl. plant to cost \$200,000, to be in operation by July next.

It is reported that Foley, Welsh & Stewart, railroad contractors, Vancouver, B. C., will erect a sawmill at Newport, at the head of Howe Sound, B. C., to take out their own ties and bridge timber.

The Grinnell Glove Company, Vancouver, B. C., will transfer its glove factory to Coquitlam, B. C., a site for the new factory having recently been acquired. The factory will be 35 x 65 ft.

Sir William Lever, soap manufacturer, will erect a large soap plant at Vancouver, B. C. It is proposed to build a model city on the plans of Port Sunlight, England.

### Government Purchases

WASHINGTON, D. C., November 20, 1913.

Bids will be received by the Bureau of Supplies and Accounts, Navy Department, Washington, until December 9, schedule 6047, for machine reamers and metal slitting saws for Washington; schedule 6051, for two worm-gearied chain blocks, one of 1000 lb. and one of 2000 lb. capacity; schedule 6056, for a direct-current motor for Key West; schedule 6057, for cargo oil pumps and spare parts for Norfolk.

Until December 16, schedule 6040, for ventilating fans for Puget Sound; schedule 6066, for one universal tool-grinding machine and one universal milling machine for Brooklyn.

Until December 23, schedule 6063, for rough brass gate valves for Portsmouth, Philadelphia and Brooklyn, rough brass screwed valves for Mare Island, Puget Sound, Portsmouth, Boston, Brooklyn, Philadelphia and Norfolk; under schedule 6067 for a machine for recutting valves and discs for Puget Sound.

Bids will be received at the office of the lighthouse inspector, Cincinnati, Ohio, until November 28 for two boilers for the tender Goldenrod.

Bids will be received until December 16 by the pay-

master-general of the navy for furnishing the following supplies:

Schedule 6035—Construction and Repair.

Class 2, Puget Sound—Two pumping engines and two fresh-water pumps.

Class 2, Alternate—F.o.b. works.

Schedule 6036—Construction and Repair.

Class 3, Puget Sound—One combined hand-operated windlass.

Class 3, Alternate—F.o.b. works.

The following bids were received by the purchasing agent, District Government, Washington, D. C., November 13, for furnishing one clam-shell bucket for the sewer department:

G. H. Williams Company, \$300, \$350, \$389 and \$435.

Hayward Company, \$390; 5 days.

But one proposal, that of the American Engineering Company, was received by the depot quartermaster, New York City, under schedule No. 478, opened November 3, 1913, for furnishing and delivering one towing machine, steam, with automatic winder, namely, No. C, Providence, \$2200 each; No. D, \$2850 each.

The following bid was received by the purchasing agent, District Government, Washington, D. C., November 13, for furnishing one hoisting engine:

Lidgerwood Mfg. Company, \$953.41.

## "Primary Heat Treatment" of Cast Iron

### Two Practical Examples Disproving the Theory that Casting Temperature and Depth of Chill Are Proportional

In the issue of the Foundry Trade Journal (London, England) for October, David Whitelaw raises the question whether the term "heat treatment" should not be further qualified by the adjectives "primary" and "secondary." He suggests that the term "primary heat treatment" be applied collectively to those conditions brought about by the melting, casting, solidification, and the cooling subsequent to the solidification of a metal or alloy; that the term "secondary heat treatment" embrace those conditions set up by the reheating and annealing, or the reheating and quenching at a given temperature, or any other heat treatment to which a metal or alloy may be subjected after it has been cast and cooled to ordinary temperatures. He adds that, since all points are of equal importance and since the various questions are so correlated that the discussion of one involves the discussion of all, a beginning may be made with the question of casting temperature.

### Combined Carbon Not Proportional to Temperature

The author then cites a recent most unqualified assertion to the effect that "it has now been clearly demonstrated that the higher the casting temperature the more combined carbon is there likely to be in the final casting." Admitting that there are conditions where the latter may be the result of the former, the statement is made that these conditions are not universal, to say the least, and Mr. Whitelaw uses two instances to prove this, as follows:

"A small jacketed cylinder weighing about 25 cwt. was cast with metal which proved to be too hard to be machined. When the casting was broken up, the bottom parts of the jacket were found to be gray, while the top parts were chilled. The chilling grew in depth from the middle parts upward, until at the top the metal was white throughout. The jacket was run through the bottom, the metal being poured down the barrel; that is to say, the metal which finally reached the top passed first through the bottom. In its passage the metal must have given up some of its heat to the bottom parts of the mold, and thus, when it reached the top parts, the metal must have been at a lower temperature than that which the bottom parts of the mold finally received. In other words, the top parts of the jacket were cast at a lower temperature than the bottom parts. Here, then, was a case in which the combined carbon was increased by lowering the casting temperature.

"A result opposite to that just described was obtained in the case of three chill blocks, which were all cast from the same ladle but at different times. The one cast first had about  $\frac{5}{8}$  in. of a chill, the second about  $\frac{1}{2}$  in., while the third had only a trace of a chill. By the time the third block was cast the metal was almost too pasty to run. The explanation of these opposite results may not be easy, but whether they be explained

or not, the results which any given sets of conditions will produce must be known in practice."

### Effect of the Conductivity of the Mold

An explanation of these two contrary conditions must be formed, says the author, by dealing fully with the primary heat treatment or a consideration of the casting temperature. Prolonged cooling reduces the amount of combined carbon, and any condition which affects the rate of cooling is important. One such condition is the conductivity of the mold, which will vary with its thickness, composition and temperature. It has been generally believed that, because of difference in composition between a green sand and a loam mold, a green sand mold will give a harder casting than a loam mold. Exactly opposite results have been obtained, though both castings were made of exactly the same metal and one was 50 times as heavy as the other. There are thus a number of variable conditions which make general statements valueless, but it is evident that the rate of cooling is affected by the conductivity of the mold, which is in turn influenced by the casting temperature.

The cooling of a casting must take place by the heat of the metal escaping through the mold. A high casting temperature will therefore reduce the rate of cooling by reducing the conductivity of the mold, and will reduce the rate of cooling directly by increasing the amount of heat which the metal must give up before it solidifies. Hence the temperature of the mold and that of the metal are the determining conditions.

### The Two Contradictory Cases Explained

In the case of the cylinder referred to, no chilling would have taken place if the casting temperature had been high enough to insure that, before the metal at the top had been brought near to the point of solidification, it had given the top parts of the mold sufficient heat to raise their temperature to that of the bottom parts. In this way, before chilling could have taken place, the conductivity of the top parts would have been reduced to what was finally the conductivity of the bottom parts where no chilling took place. As it was, the temperatures there were conducive to chilling.

In the case of the chill blocks, it is shown that there is a point below which rapid cooling will not produce chilling, or a point which may be called the chilling temperature limit. There the casting temperature almost coincides with the chilling temperature limit, and hence the first block was chilled most deeply because the metal was then near the proper chilling temperature and just after that fell below, so that the other blocks had less chilled surface.

### Conclusions

The author concludes that in those cases where a high combined carbon results from a high casting temperature, the conditions are similar to those of a chill mold; that is to say, the conditions favor a rapid cooling down to, or near to, the chilling temperature limit. In any case, the whole of the conditions must be taken into consideration, and it should be noted that in most cases no definite statement can be made as to the effect of casting temperature alone, for it is usually impossible to vary the casting temperature without also varying the conductivity of the mold, and therefore the rate of cooling. It cannot be too strongly emphasized that not one but all the conditions must be kept in view, and if not controlled, they should as far as possible be allowed for.

One of the excursions planned in connection with the annual meeting of the American Society of Mechanical Engineers, to be held in New York December 2 to 5, is to the plant of the Davis-Bournonville Company, Jersey City. The excursion will be made on the afternoon of Thursday, December 4, and an exhibition of the recent development of the oxy-acetylene and oxy-hydric processes of welding and cutting metals is to be given. It is planned to show the commercial method of producing the various gases, and demonstrations are promised of hand welding of cast iron, steel, copper, brass and aluminum, as well as steel barrel welding with an automatic machine and various machine applications of the torch, including the Oxygraph for cutting steel from 1 to 4 in. in thickness to a drawing.